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from A. H. W.

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PLATE I.

The specimens figured on this plate are now in the Illinois State Museum. They were collected by Dr. Oliver Everett from the Trenton limestone near Dixon, Ill.

PAGE.

Fig. 1. **Anthaspidella mammulata** U. & E. 258

1. View of cup, showing the distribution of the oscula, their elevated margins, and the dense external layer, worn away at the margin. Natural size.

1 *a*. Transverse section showing the thickness of the sponge and the vertical arrangement of the canals. Natural size.

1 *b*. Vertical section showing several canals and the direction of the spicule columns.

1 *c*. Portion of 1 *b*, x18.

1 *d*. Central portion of 1 *a*, x18, showing the arrangement of the spicules.

Fig. 2. **Anthaspidella florifera** U. & E. (See also Pl. IV.).......................... 259

View of upper surface of a medium sized specimen, showing arrangement of oscula and canals. Natural size.

Fig. 3. **Anthaspidella parvistellata** U. & E.. 260

Upper surface of the type specimen, natural size. The radial canals have been worn or ground away so that the mouths of the radial canals are exposed.

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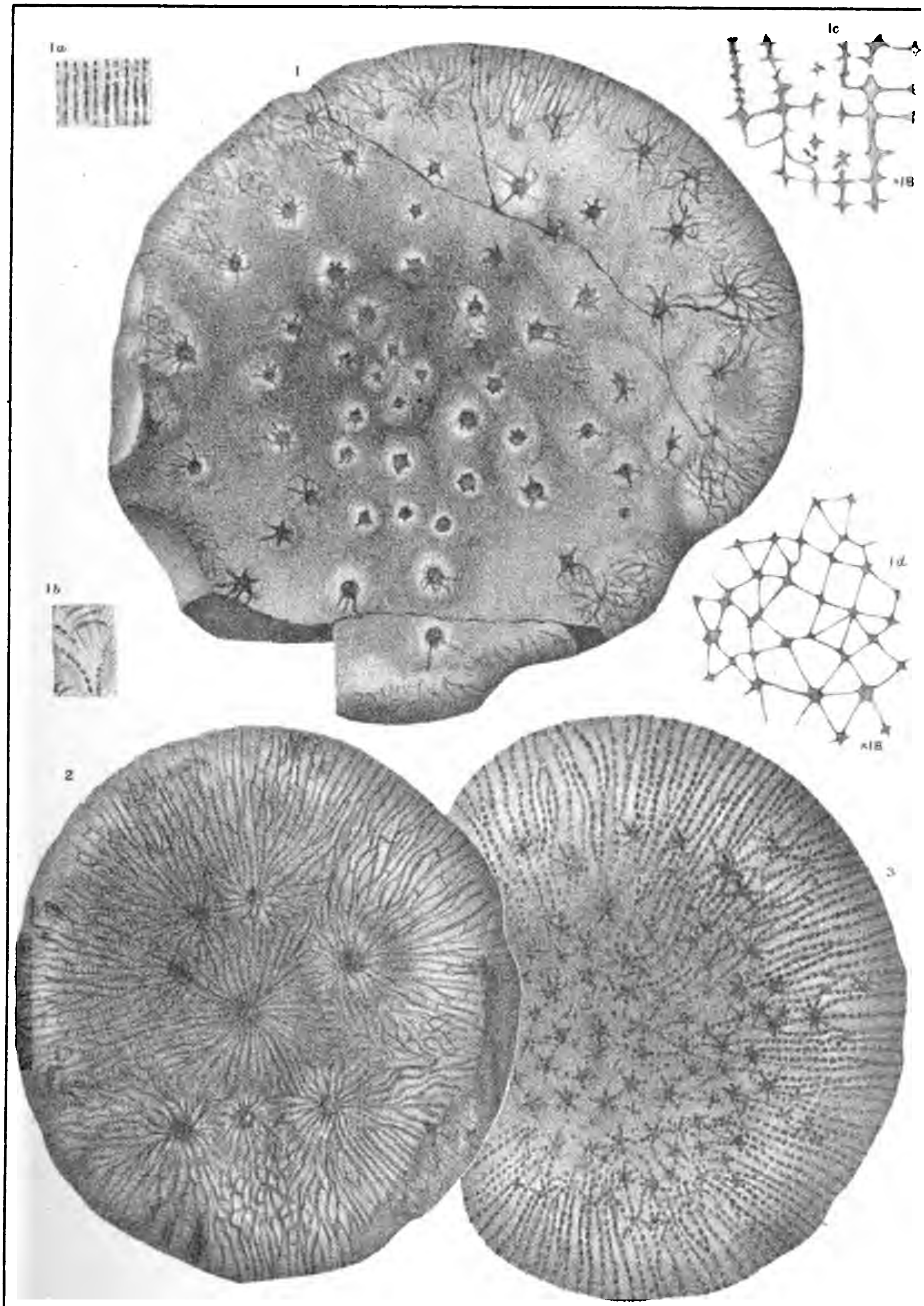

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PLATE II.

Excepting fig. 4c, all the specimens figured on this plate are now in the Illinois State Museum. They were collected by Dr. Oliver Everett from the Trenton limestone. near Dixon, Ill.

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Fig. 1. ANTHASPIDELLA FENESTRATA U. & E. 264
Lateral view of the type specimen, showing the oblique cup, and the arrangement of the oscula and canals.

Fig. 2. ANTHASPIDELLA GRANDIS U. & E. 262
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2 *a*. A small portion of the lower surface showing the irregular character of the canals on this side. Natural size.

Fig. 3. ANTHASPIDELLA FIRMA U. & E. 263
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Fig. 4. HINDIA INÆQUALIS U. & E. 275
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4 *a*. Transverse section of same, x25, showing the spicules and the unequal size of the radiate canals.
4 *b*. Shows the appearance of the skeleton in vertical sections, x25.

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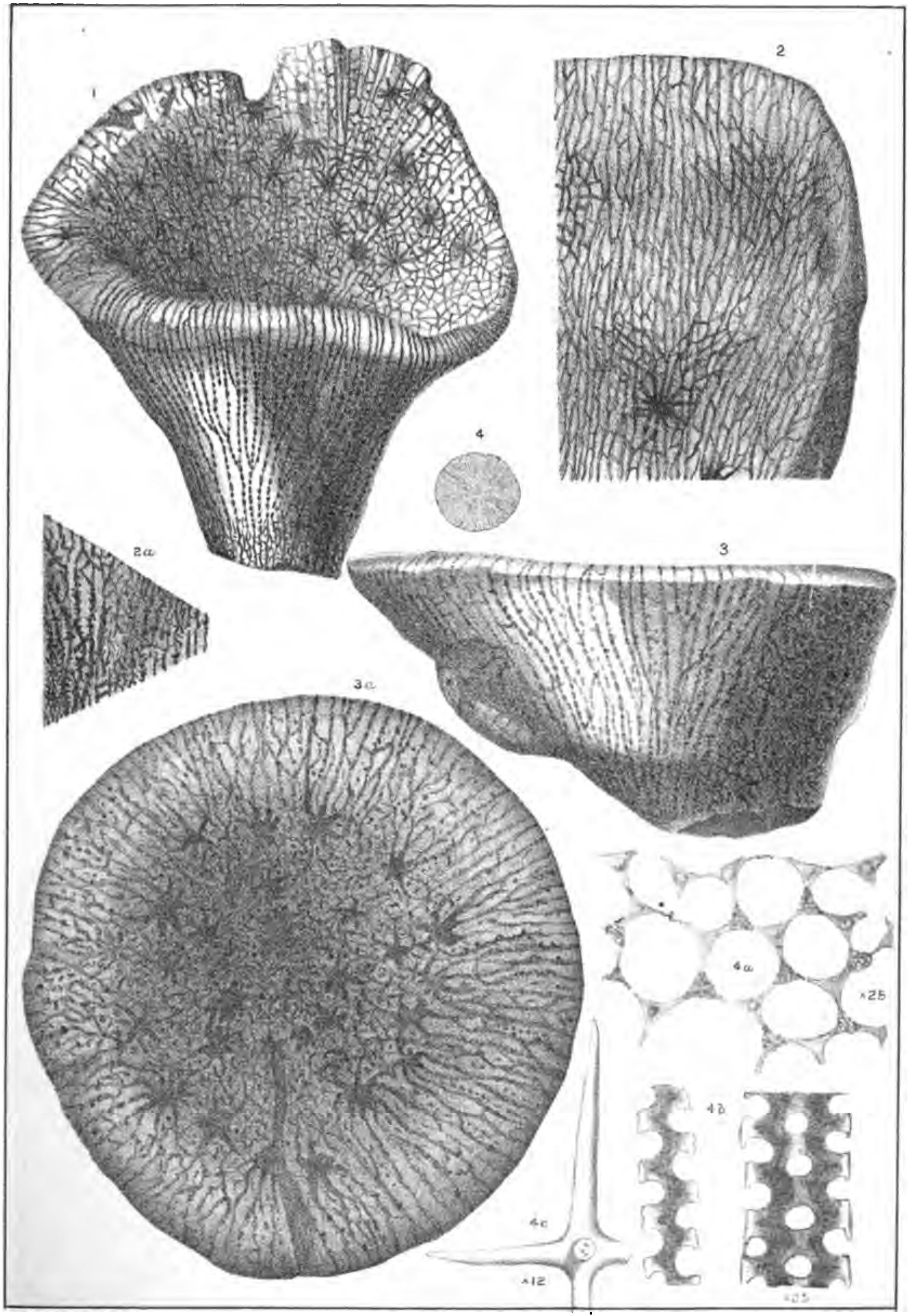

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PLATE III.

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Fig. 1. **ANTHASPIDELLA SCUTULA** U. & E. 261

1. View of half the upper surface of the best specimen seen. Natural size.
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Trenton limestone, Dixon, Ill.
Illinois State Museum.

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2 *b*. One of the bundles of spicules as they appear on the upper surface, x12.
Burlington, Iowa.
Mr. Charles Wachsmuth's collection.

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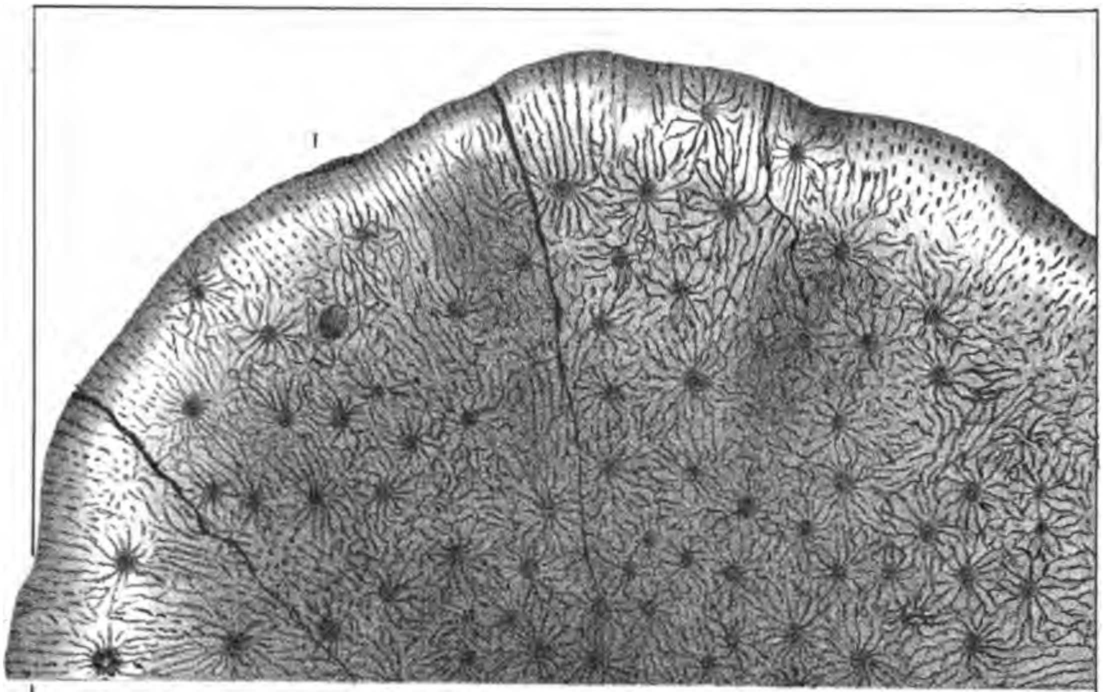

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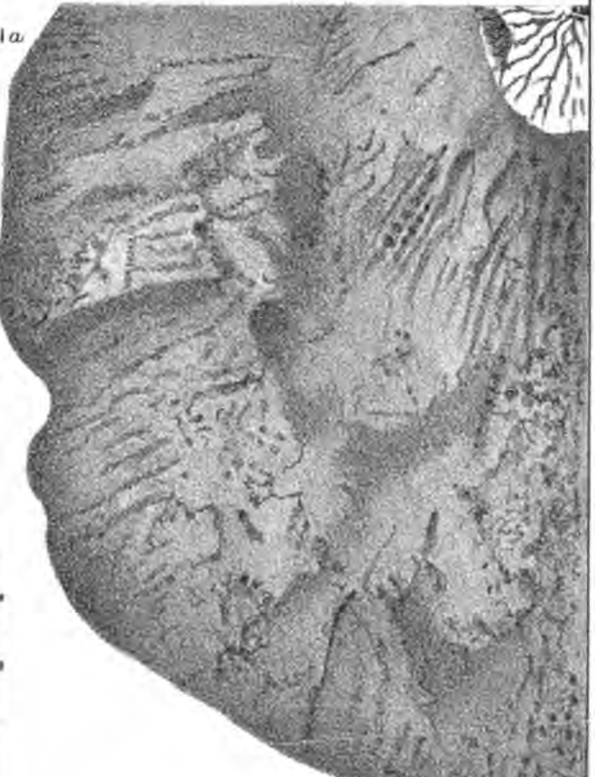

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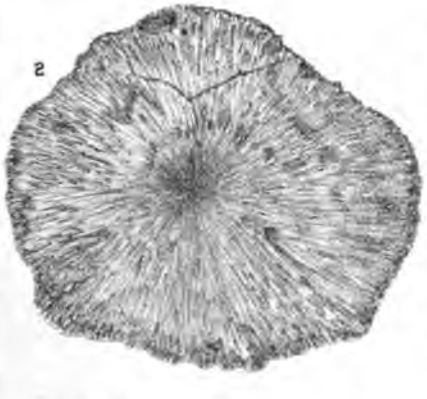

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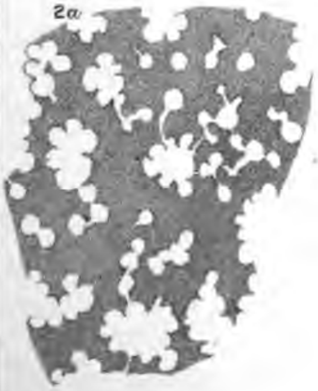

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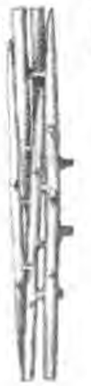

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PLATE IV.

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PAGE

Fig. 1. ANTHASPIDELLA OBLIQUA, U. & E. 265
1. Lateral view of an abraded specimen. Natural size.
1 *a*. View of upper surface of same showing the arrangement of the canals and oscula.

Fig. 2 ANTHASPIDELLA FLORIFERA, U. & E. 259
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Fig. 3. ZITTELELLA LOBATA, U. & E 270
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3 *a*. The lower surface of a larger specimen showing the lobate character of the species. Natural size.
3 *b* and 3*c*. Small portions of transverse and vertical sections to show spicular structure, x25.

Fig. 4. STREPTOSOLEN OBCONICUS U. & E. 274
4 and 4*a*. Two views of a specimen natural size, showing the irregular intertwining of the canals.
4 *b*. Median vertical section of the same specimen, showing the cloacal tubes and the irregular canals.

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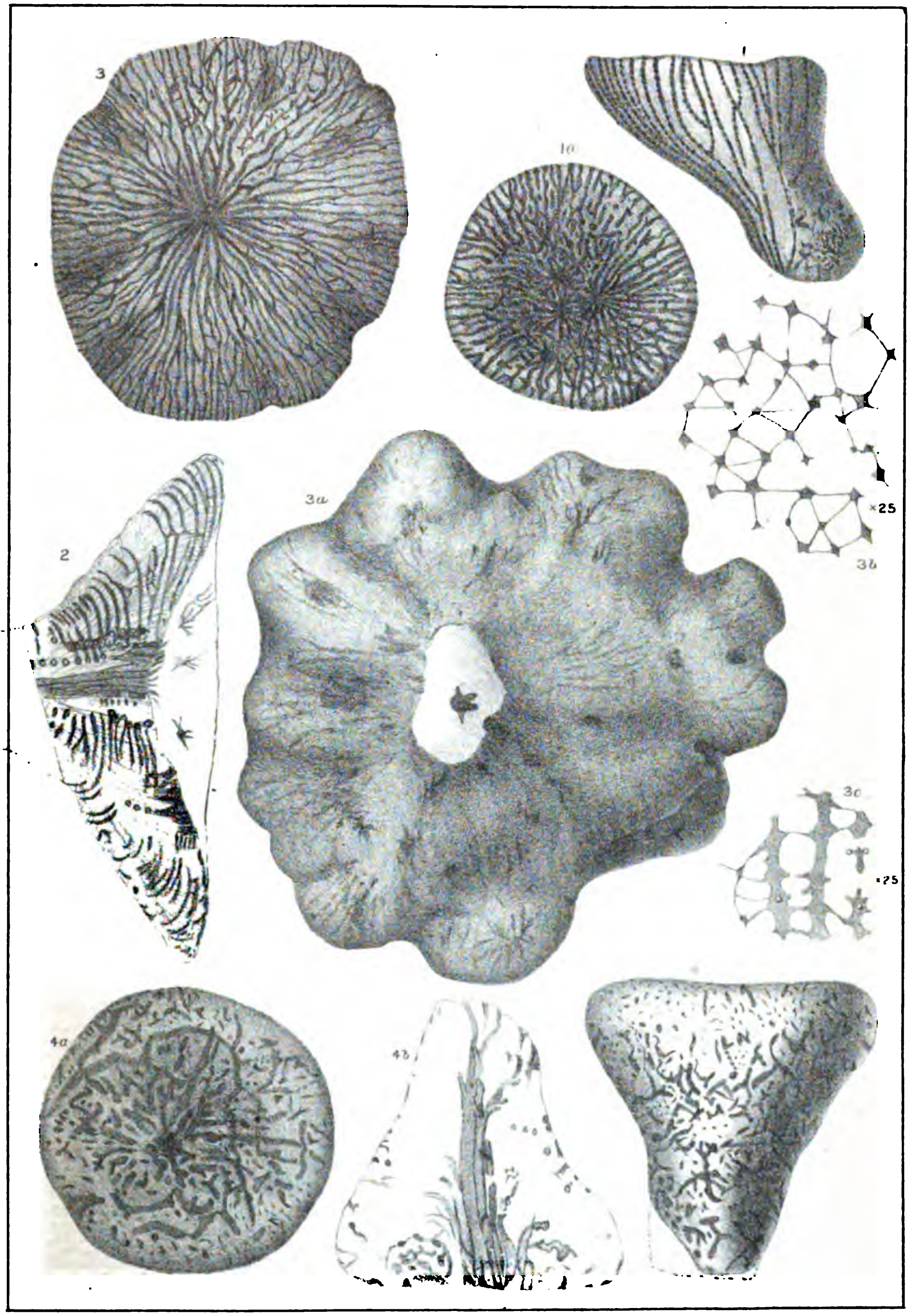

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PLATE V.

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PAGE

Fig. 1. Calathium ? infelix U. & E 274

1 and 1a. Two views of a worn specimen of this species. Natural size.

Fig. 2. Zittelella typicalis var. subrotunda U. & E 269

2 and 2*a*. Two views of a specimen showing the usual form of this variety. Natural size.

Fig. 3 and 5. Zittelella typicalis U. & E 268

3, Median vertical section, showing the cloacal tubes and the arrangement of the radiating anals and capillary tubuli. Natural size.

3 *a*. Portion of a thin vertical section, x18.

3 *b*. Portion of a transverse section, x18.

3 *c*. Transverse section of cloacal tubes, x 12.

5 and 5 *a*. Two views of the best specimen seen. Natural size.

Fig. 4. Zittelella typicalis var. pistilliformis U. & E 269

Lateral view of a specimen of this variety, larger than usual. Natural size.

Fig. 6. Zittelella inosculata U. & E 271

6. Polished upper surface of a large specimen. Natural size.

6 *a*. Lateral view of another example. Natural size.

Fig. 7. Zittelella typicalis var. turbinata U. & E 369

and 7 *a*. Two views of a specimen of this variety. Natural size.

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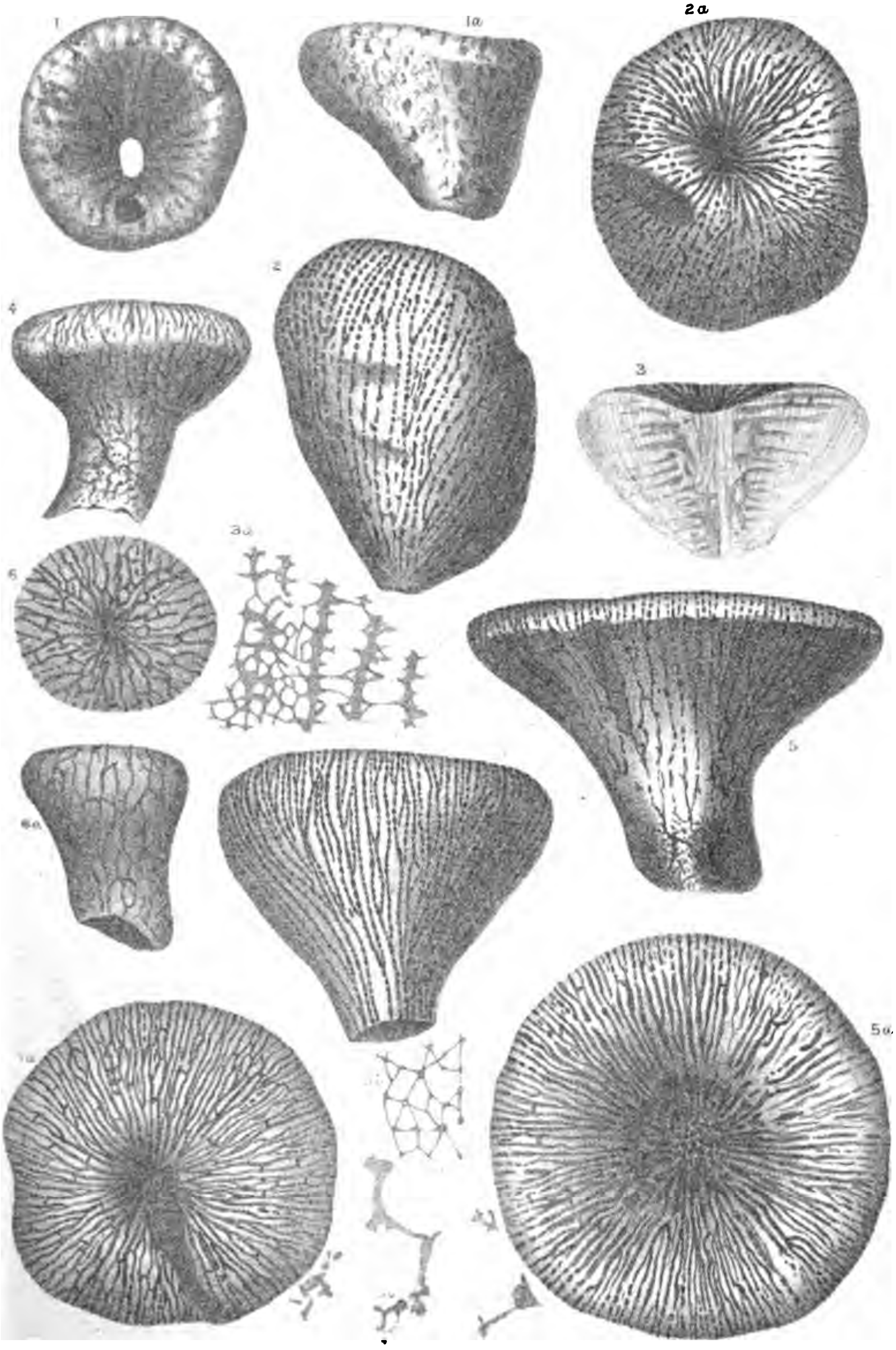

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PLATE VI.

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Fig. 1. EDRIOSPONGIA BASALIS U. & E.. and ANTHASPIDELLA, sp 272

1. Upper surface of specimen showing the osculiferous face of the *Anthaspidella*, and to the right portions of the *Edriospongia*. Natural size.

1 *a*. Lateral view of same, showing the rough base of the *Edriospongia*, its irregular sides, and above, the close union it forms with the *Anthaspidella*.

1 *b*. Portion of a smaller specimen of *E. basalis* with the upper surface ground away and polished to show the arrangement of the canals. Natural size.

1 *c*. Thin transverse section showing the spicular skeleton, x18.
Trenton limestone, Dixon, Ill. Illinois State Museum.

Fig. 2. BATOSPONGIA SPICATA Ulrich. 246

2. View of the lower side from which the dermal layer has been weathered away. Natural size.

2 *a*. A bunch of spicules of same, freed from the matrix by means of acid, x 18.

2 *b*. The inner side of the basal or dermal layer, x 18.
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Fig. YSTRIOSPONGIA CARBONARIA Ulrich 245

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Lower Coal Measures, Seville, Ill. Illinois State Museum.

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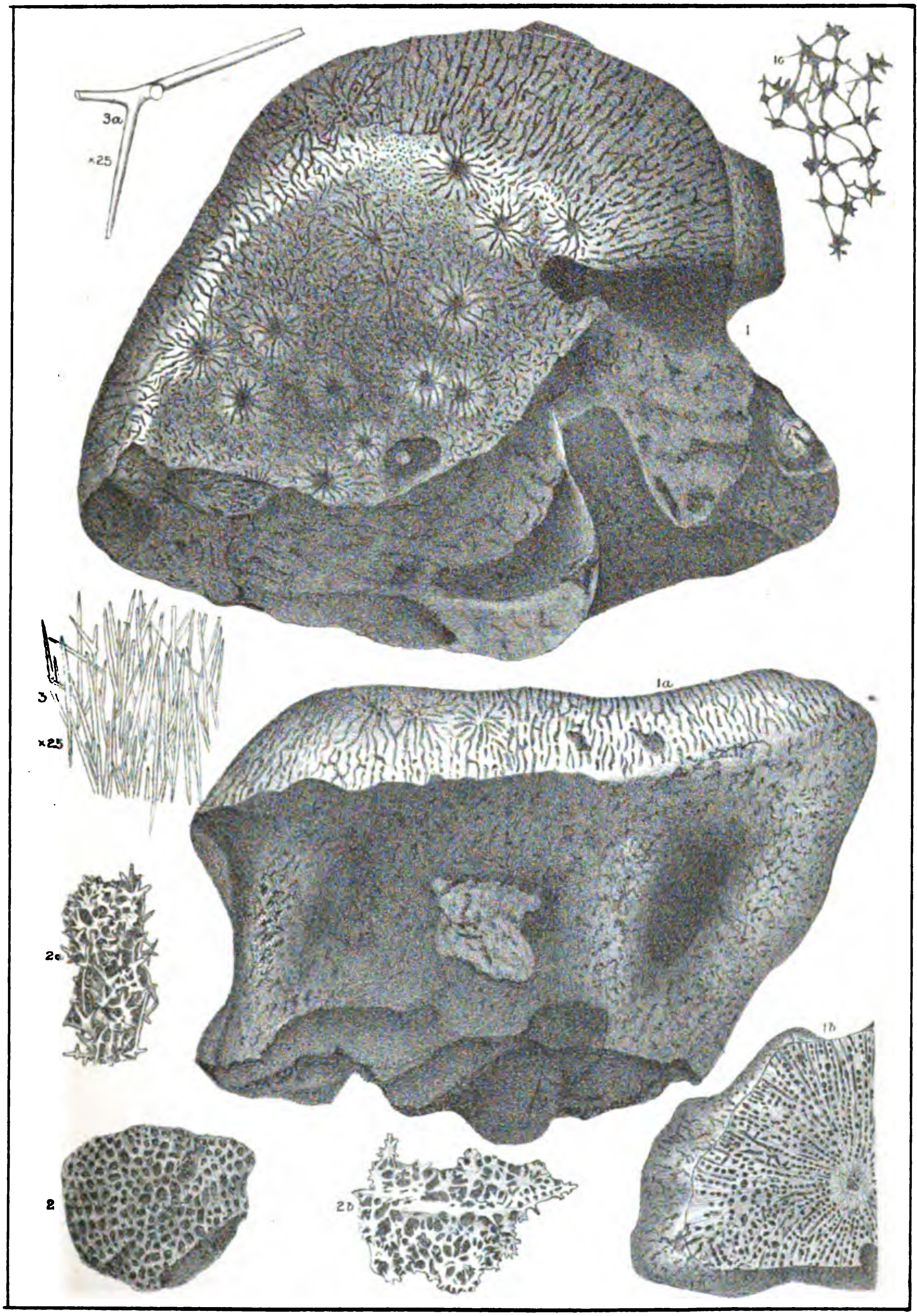

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PLATE VII.

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Fig. 1. CAMAROCLADIA DICHOTOMA U. & E. 281

1. A group of stems of the ordinary appearance and size.
1 *a*. Vertical section of a specimen preserving the walls, x9. The walls are changed to crystalline calcite, and show no structure.
1 *b*. Transverse section of another example, x9, showing minute three-rayed spicules in the chambers.

Figs. 2, 2 *a* and 2 *b*. An undetermined fossil from the Dixon sponge layer. Possibly a Stromatoporoid. Not described. The specimens are in the Illinois State Museum.

Fig. 3. ACTINOSTROMA? TRENTONENSE U. & E. 282

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Fig. 4. SYRINGELASMA WORTHENI Ulrich*. 250

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Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

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5 *a*. Transverse section of same, x18, showing the radial pillars.
5 *b*. Vertical section of same, showing the radial pillars and the horizontal arrangement of the rays. These figures are introduced for comparison with the *Anthaspidellidæ*.

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*Just after the text for the sponges had gone through the press, it was noticed that *Syringophyllum* had been preoccupied by Edwards and Haime for a genus of corals. *Syringelasma* is proposed instead.

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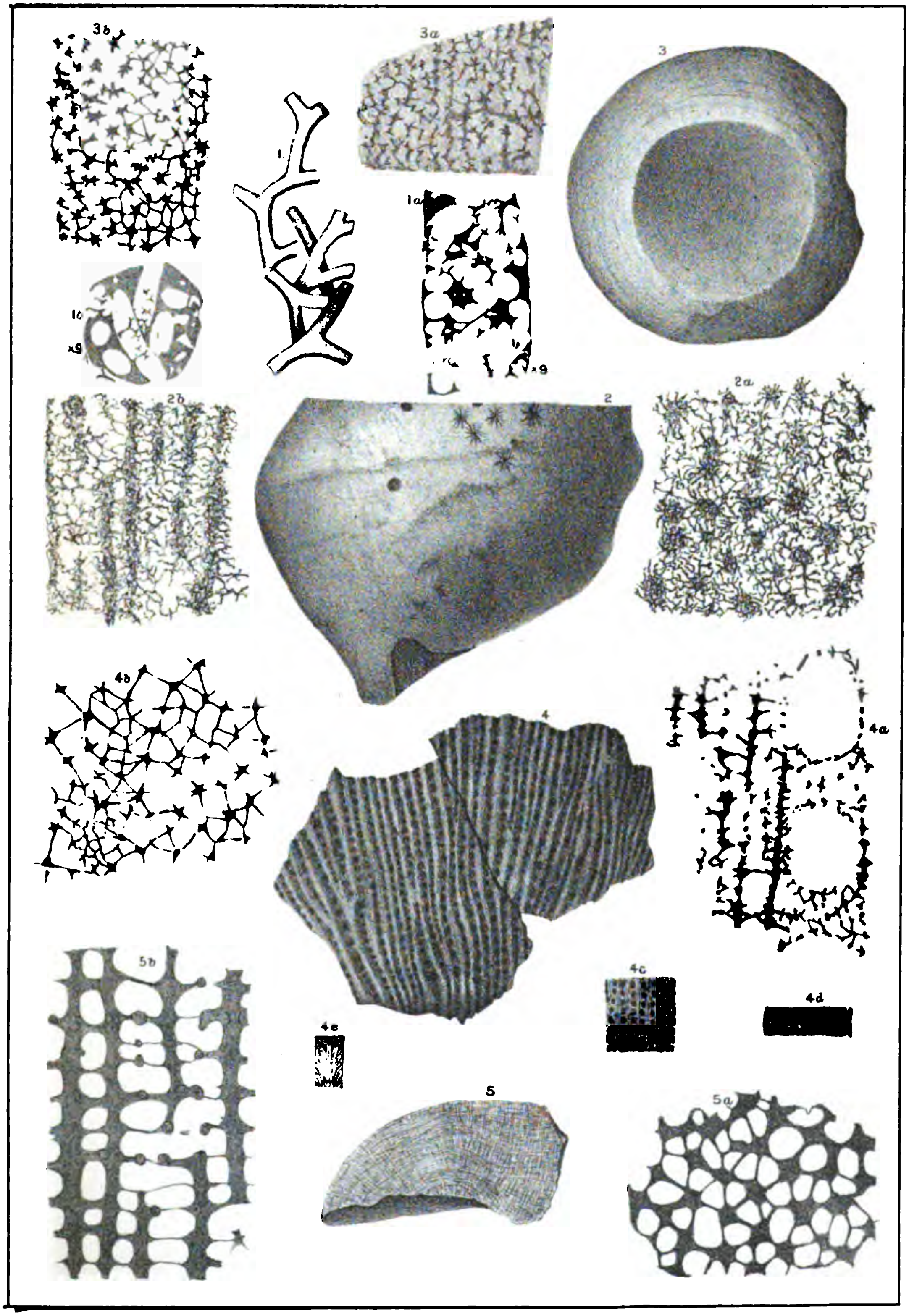

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PLATE VIII.

The specimens figured on this plate are now in the Illinois State Museum. They were collected by Dr. Oliver Everett from the Trenton limestone, near Dixon, Ill.

PAGE.

Fig. 1. STROTOSPONGIA MACULOSA U. & E. 277
- 1 and 1 *a*. Two views of the type specimen. Natural size. On the first the dark lines represent the sponge tissue, while in 1 *a*, the dark spots represent the mouths of canals.
- 1 *b*. The same specimen sawed vertically through the center to show the intertwining canals and sponge tissue. The latter is represented by dark lines.
- 1 *c*. Thin section, x9, showing relative thickness.
- 1 *d*. Portion of 1 *c*, x18, giving an obscure idea of the form and nature of the spicules. The spicular skeleton is clearly very much like that of *Dystactospongia*.

Fig. 2. ANTHASPIDELLA MAGNIFICA U. & E. 265
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- 2 *a*. Portion of the inner face of cup to show arrangement of canals and oscula. Natural size,
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- 2 *c*. Vertical section of same, showing canals, and thickness of sponge wall. Natural size.

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- 4 *a*. Transverse section, x9.

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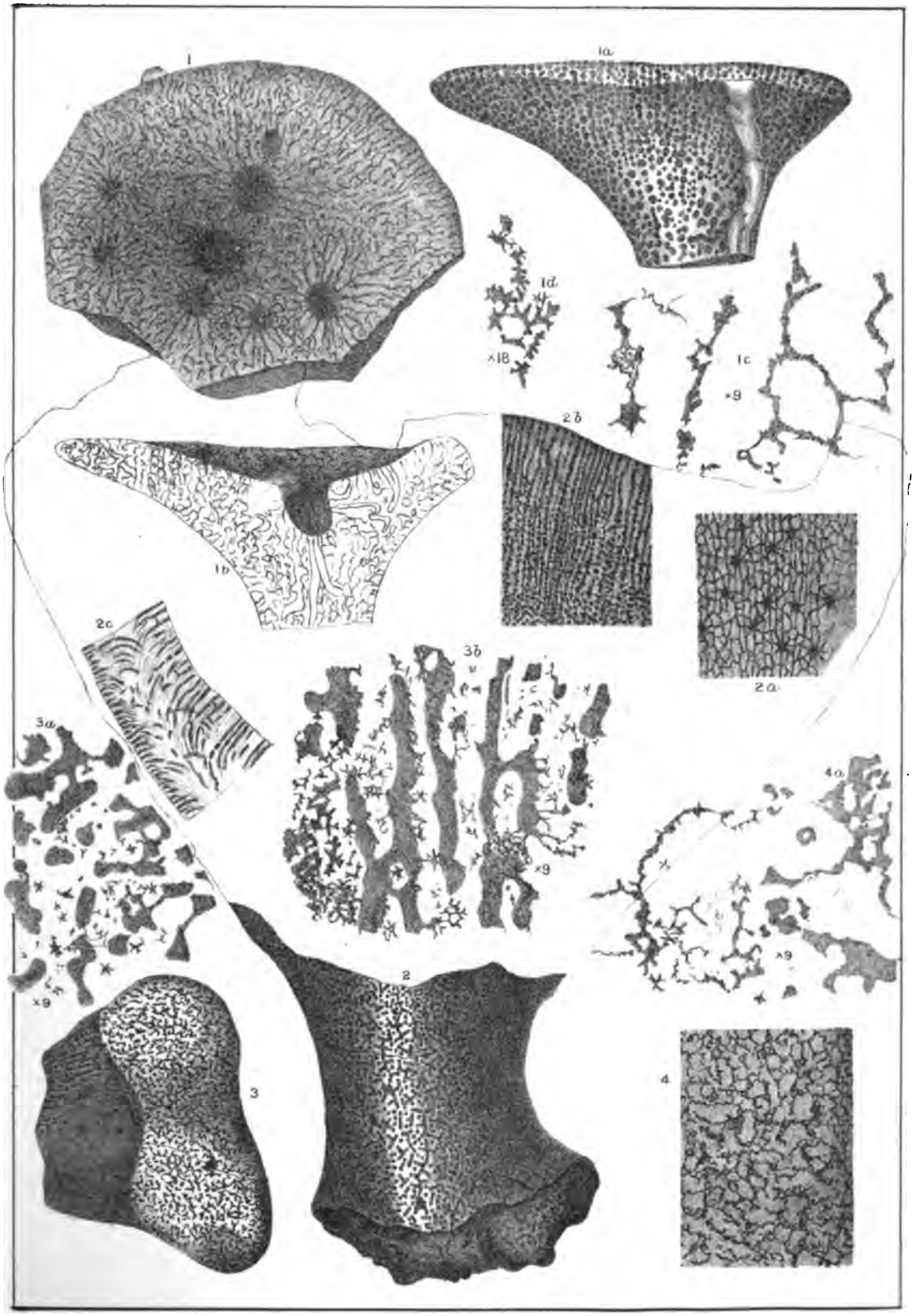

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Fig. 7. Lateral view of a specimen.
Fig. 7 *a*. View of the calyx.

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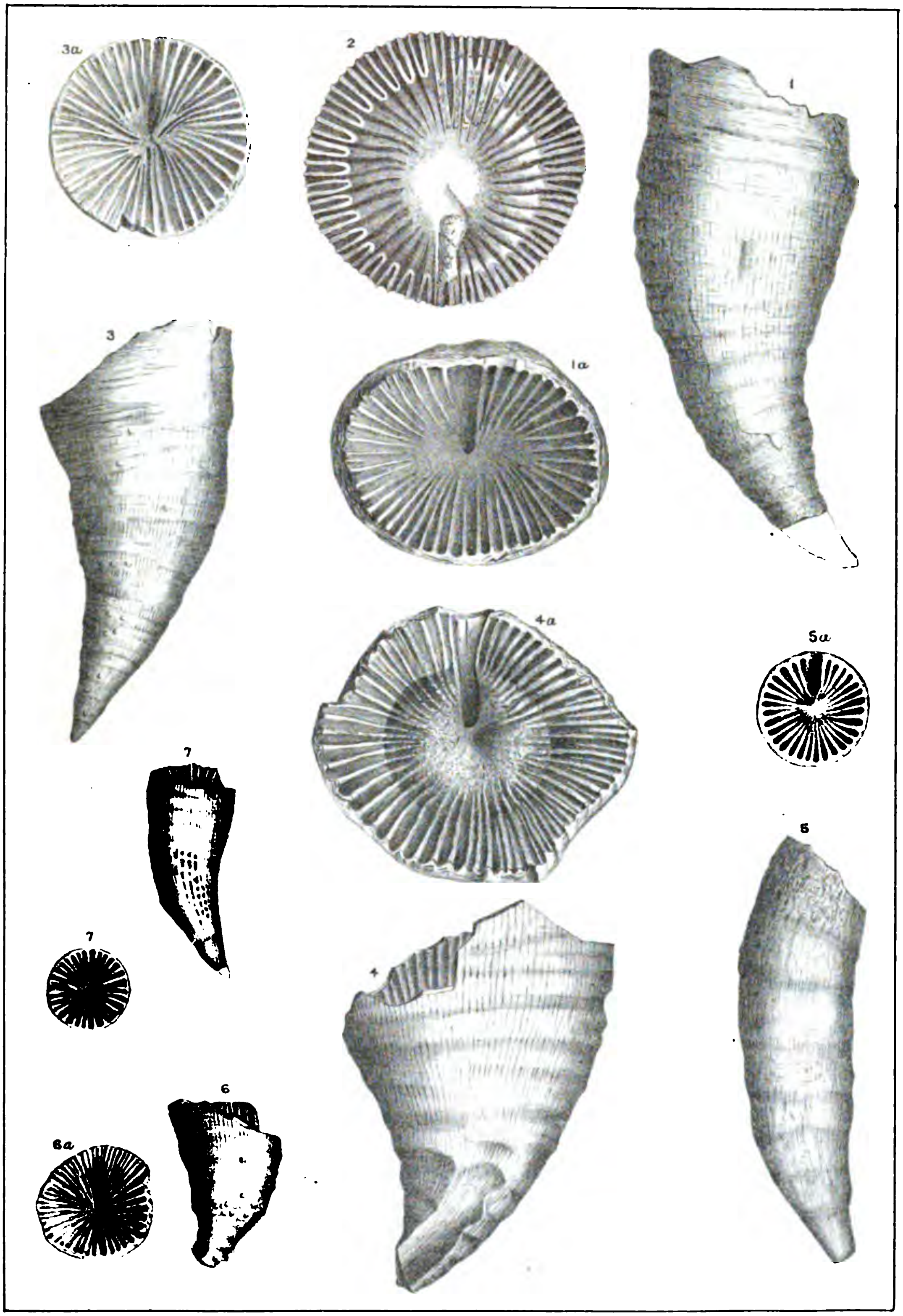

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Fossil Corals.

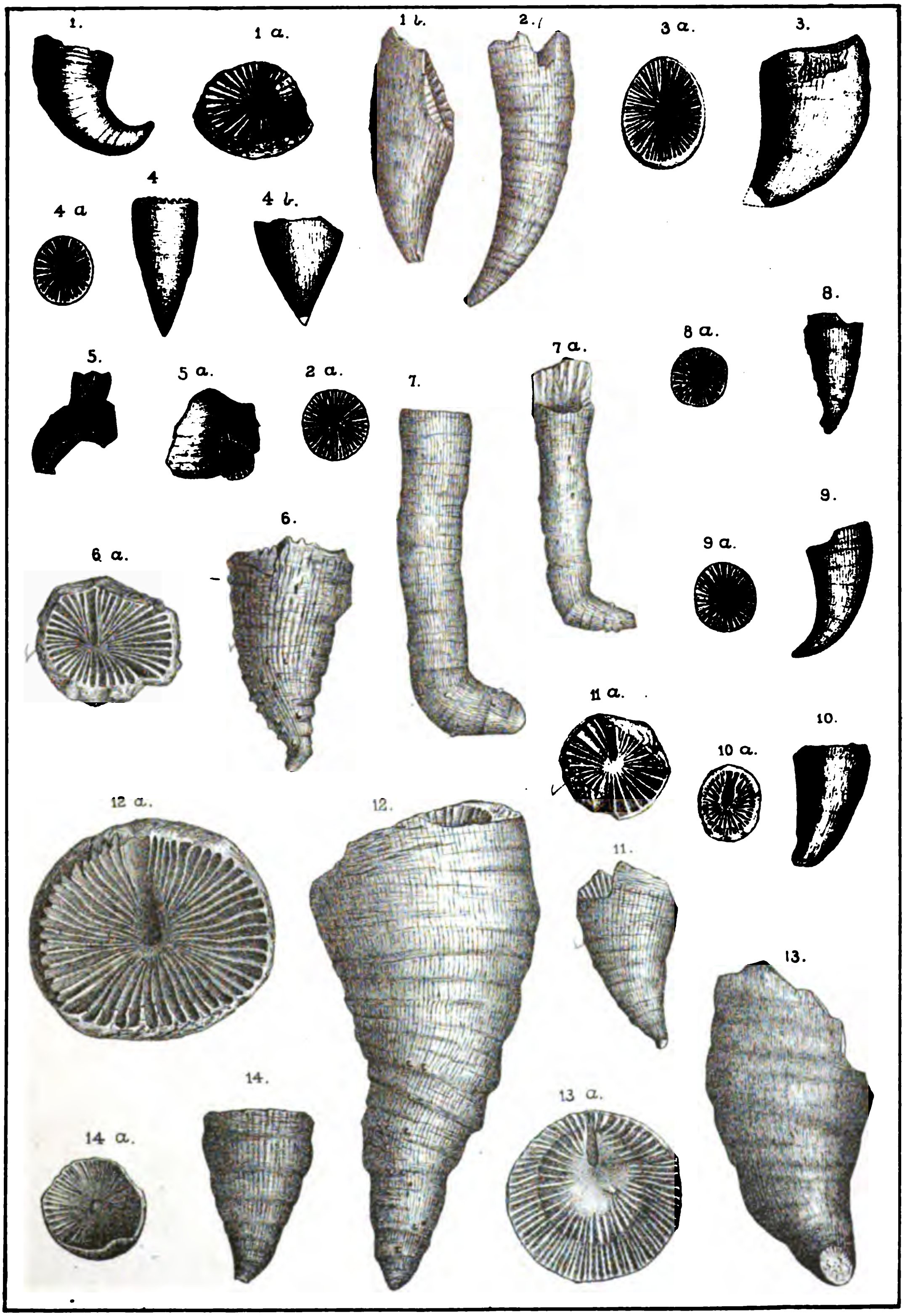

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Fig. 1 *b*. Transverse section polished.
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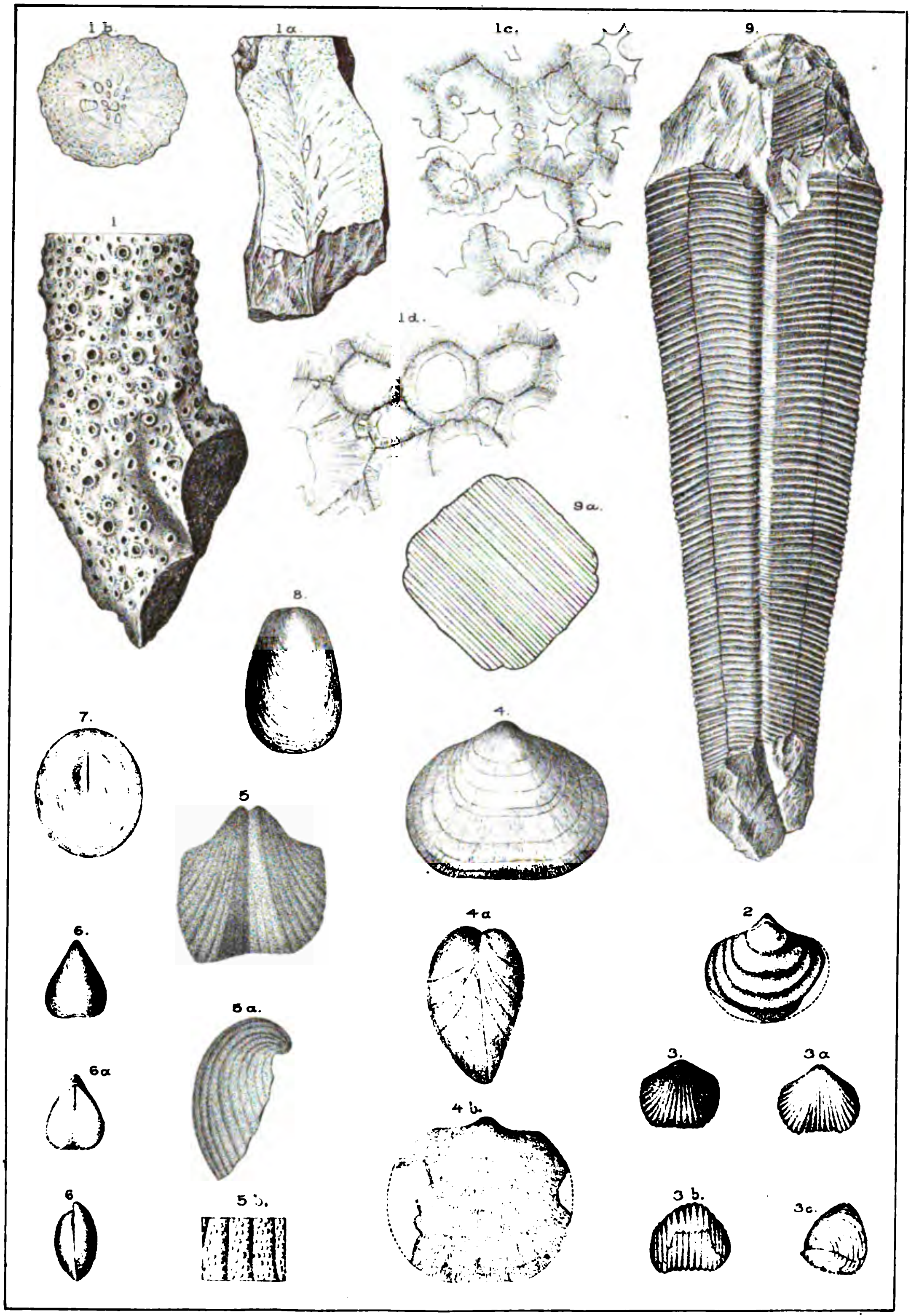
(Miscellaneous.)



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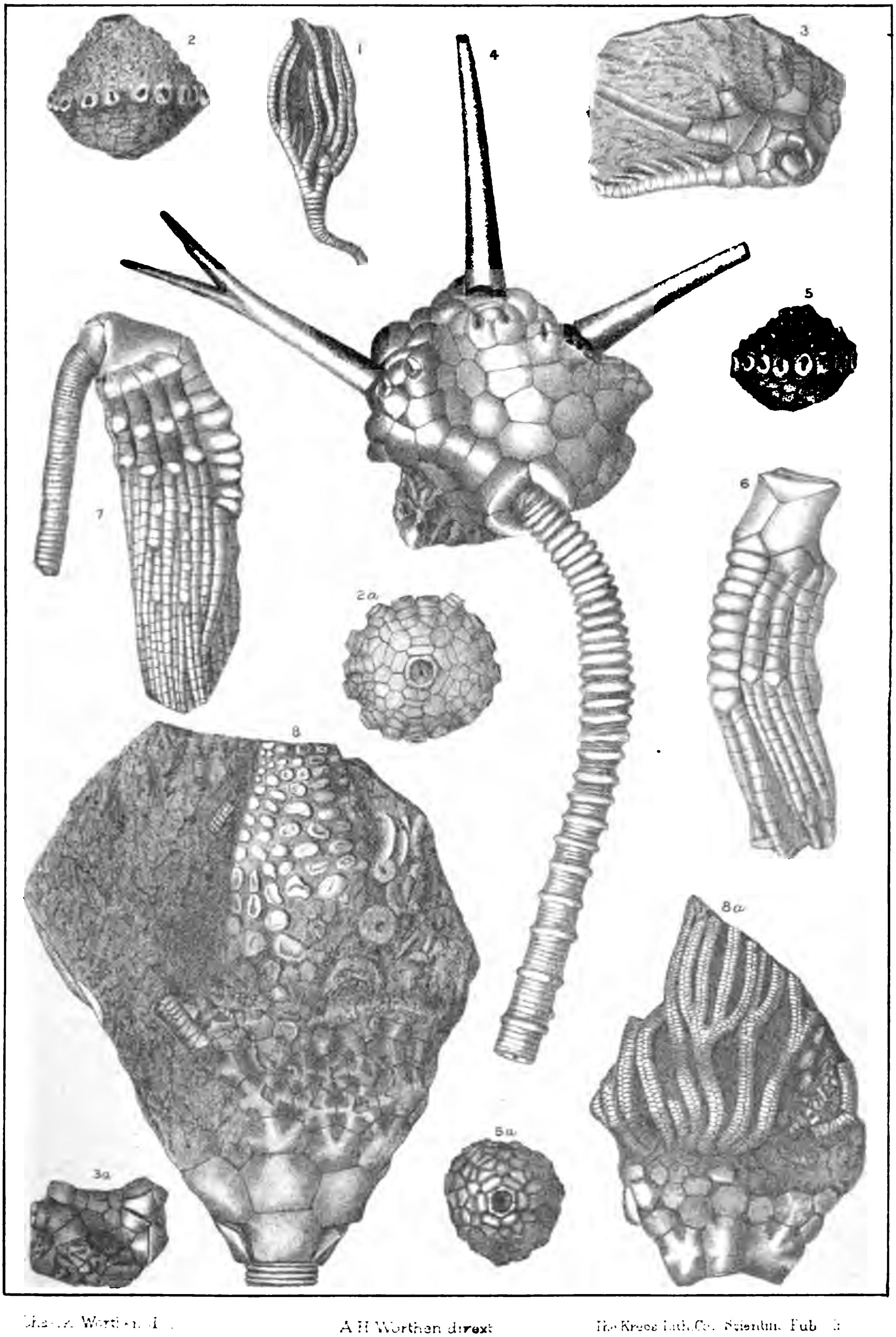
(Crinoidea.)



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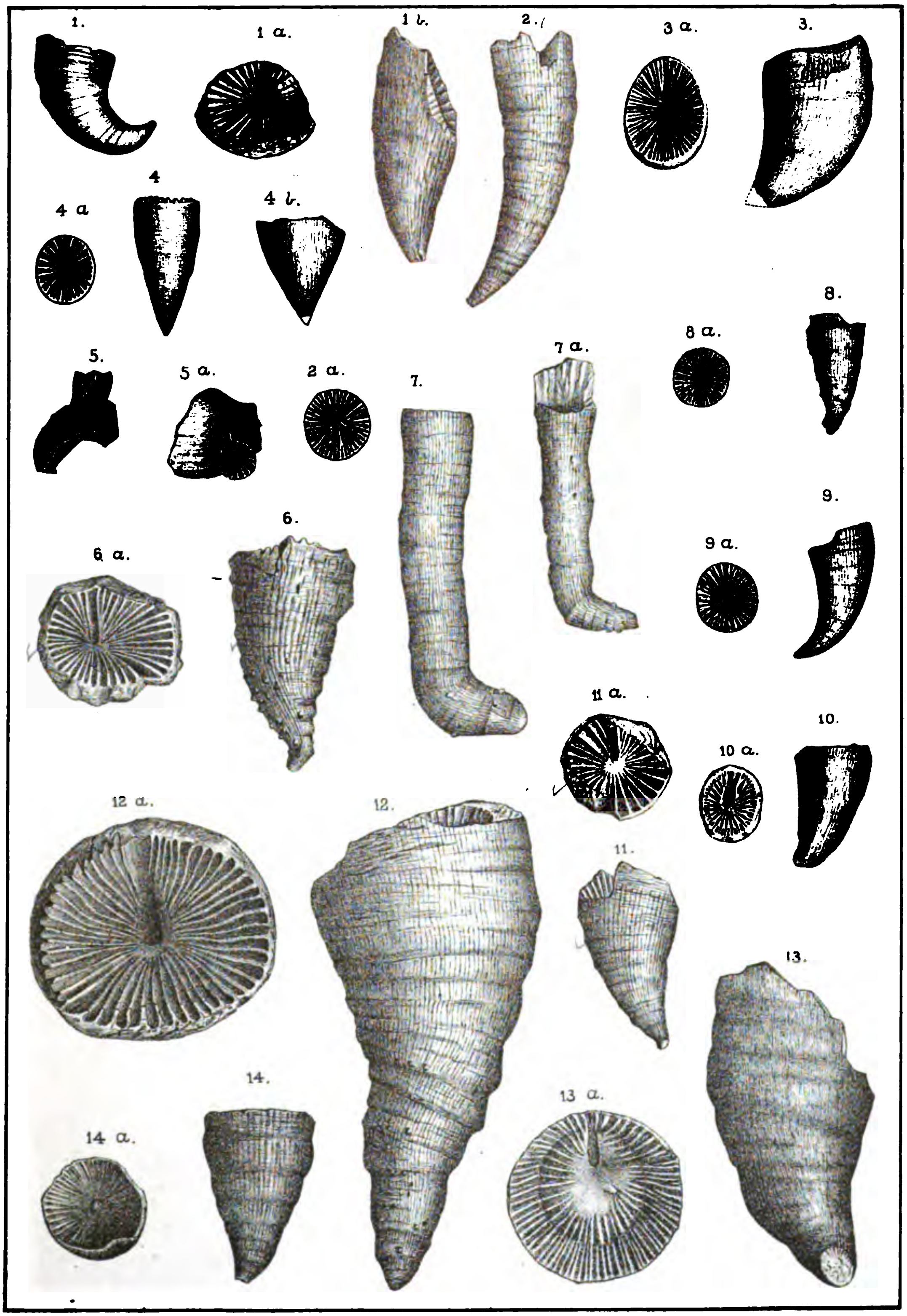

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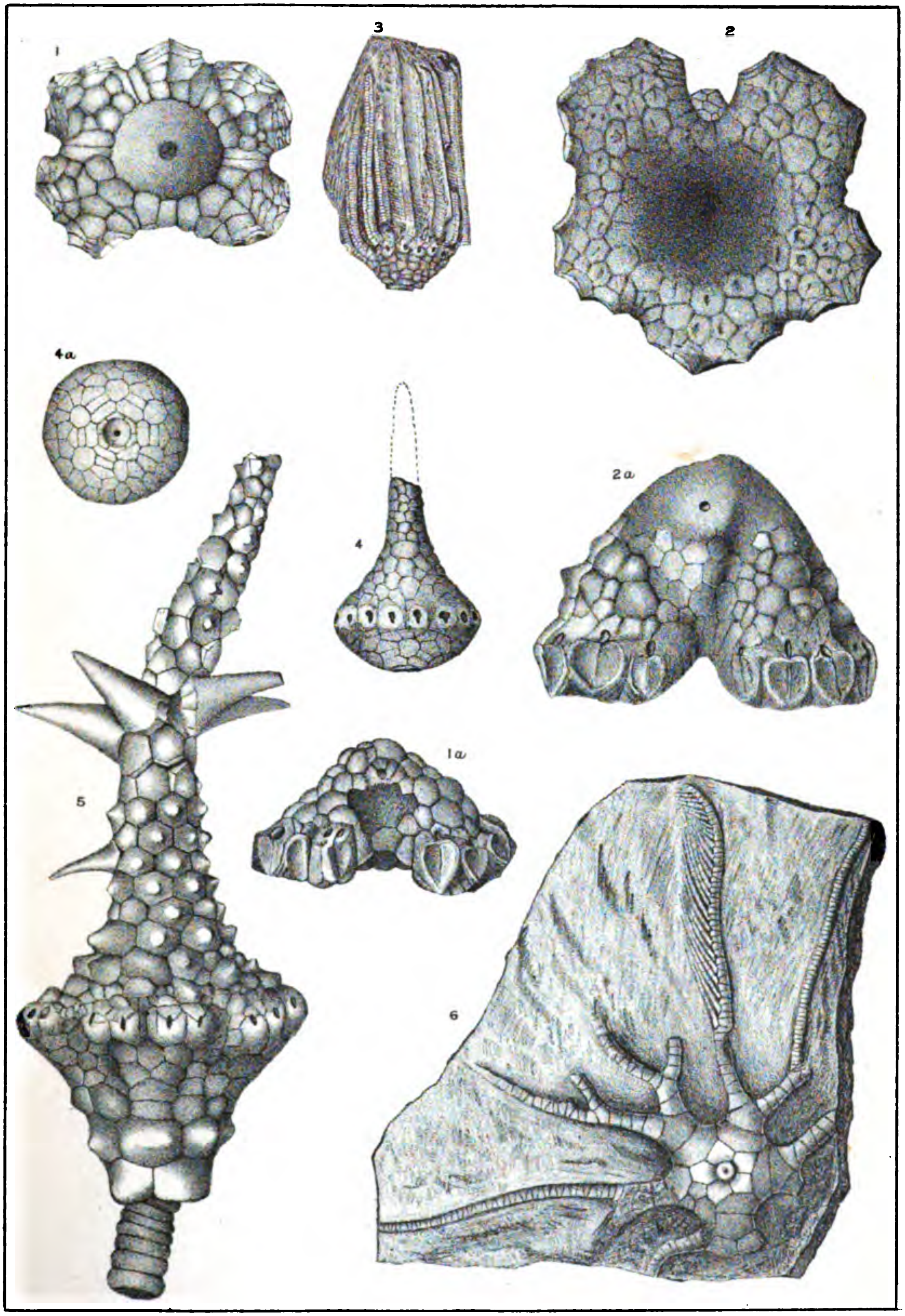

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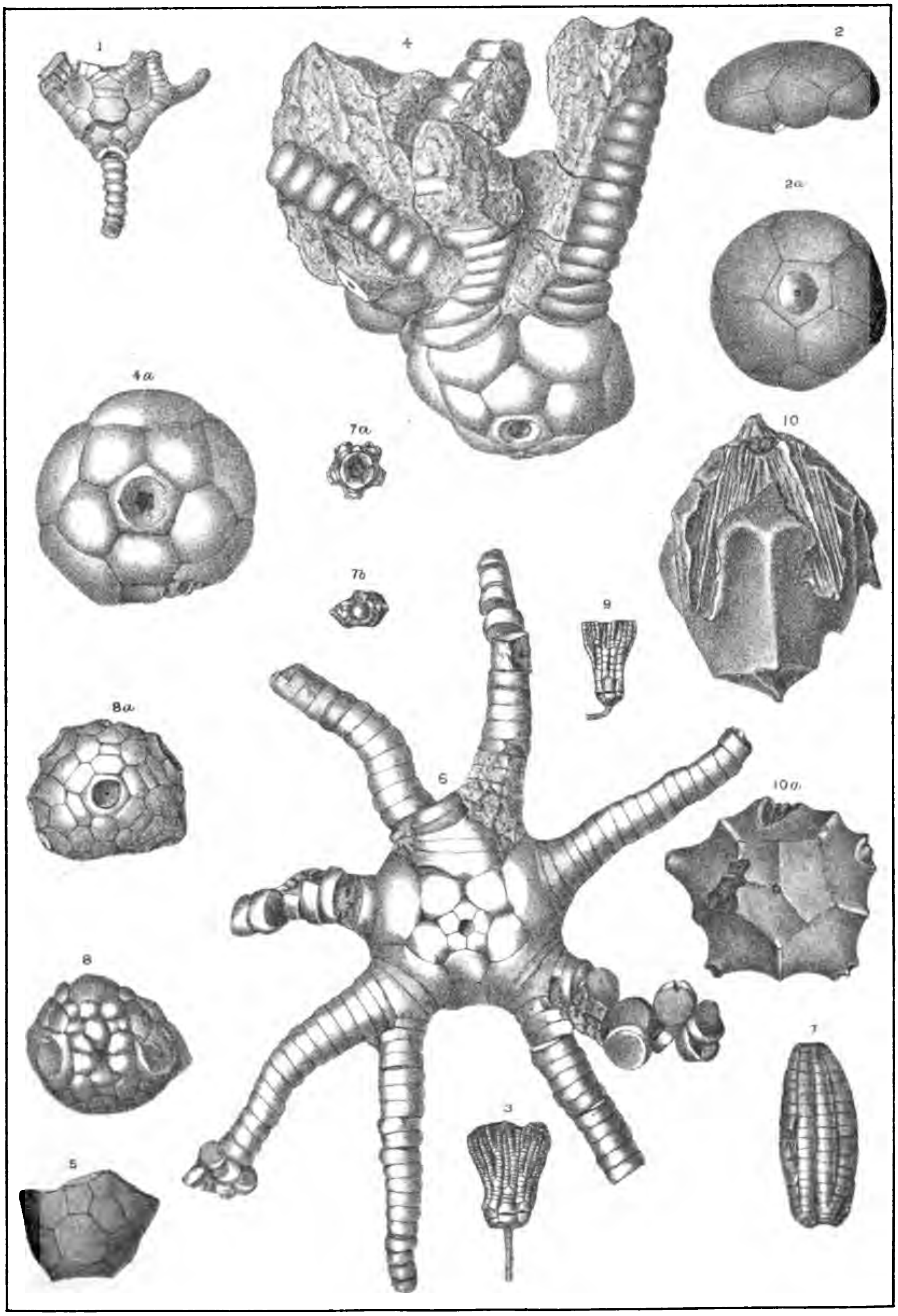

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Crinoidea and Blastoidea

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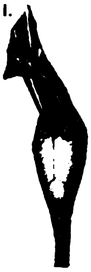

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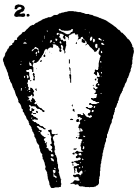

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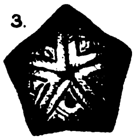

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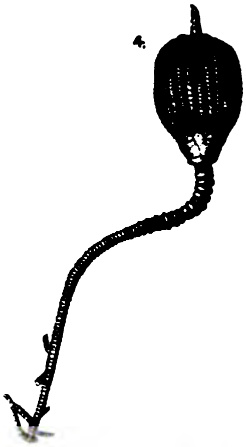

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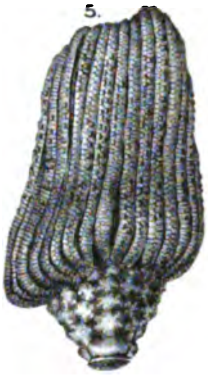

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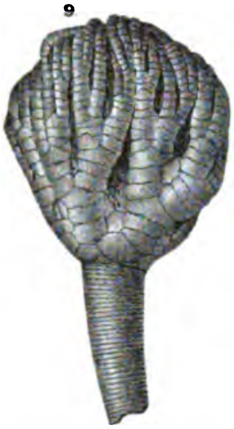

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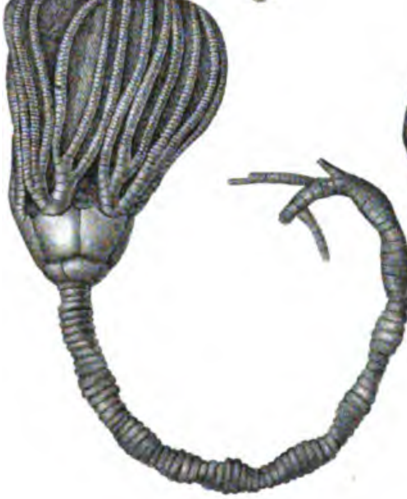

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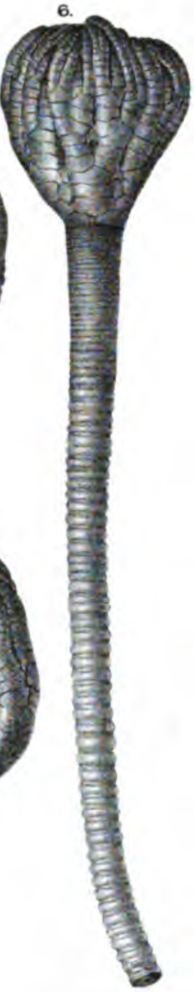

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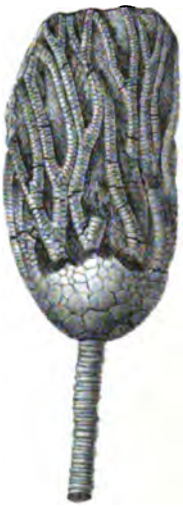

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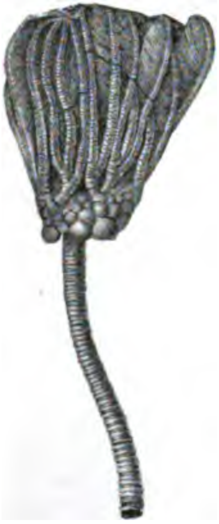

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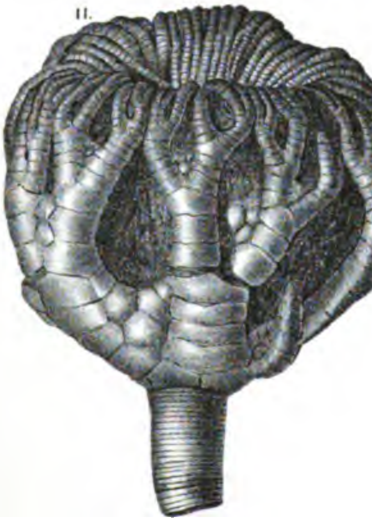

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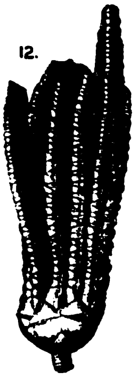

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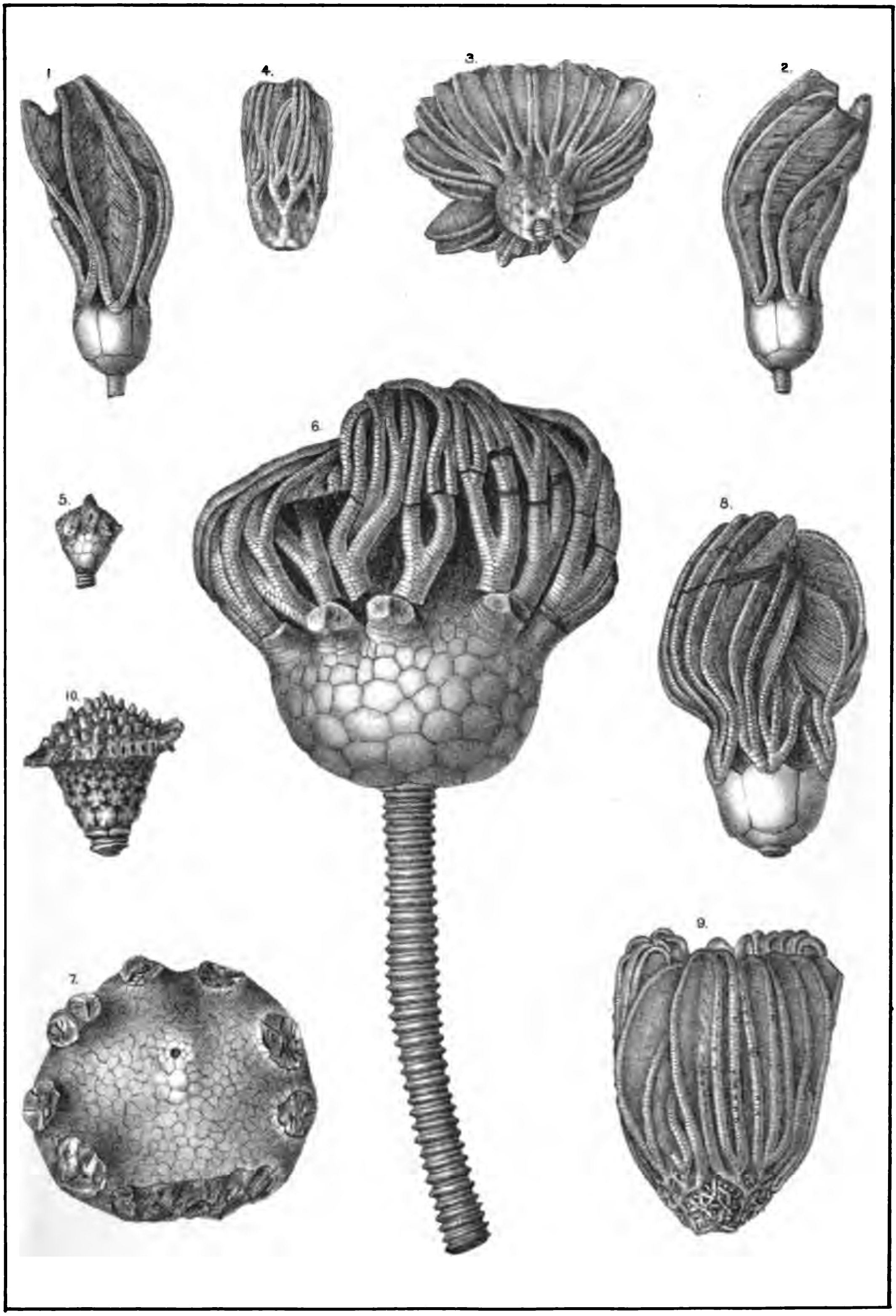

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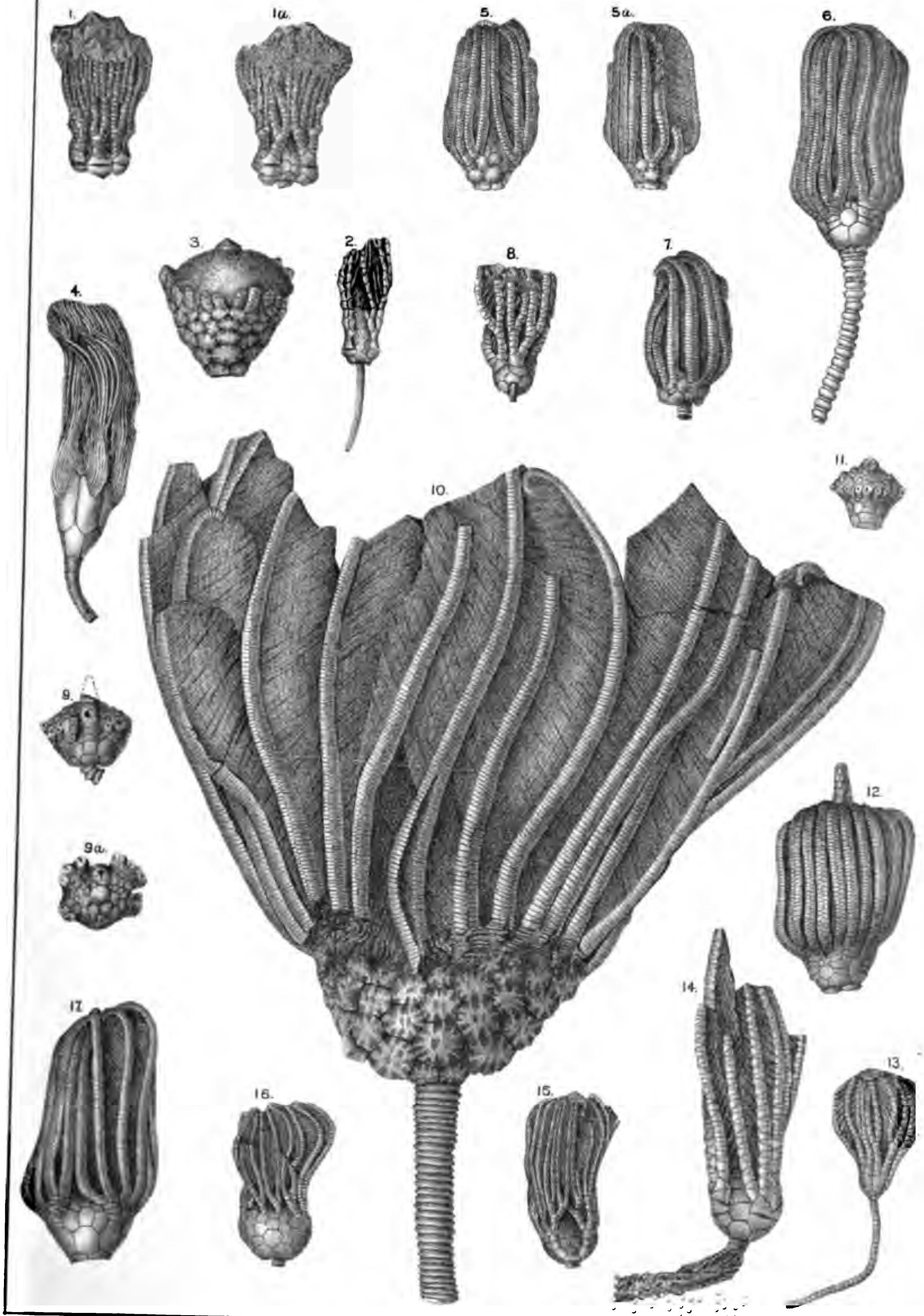

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Fig. 7. Typical specimen, right valve.

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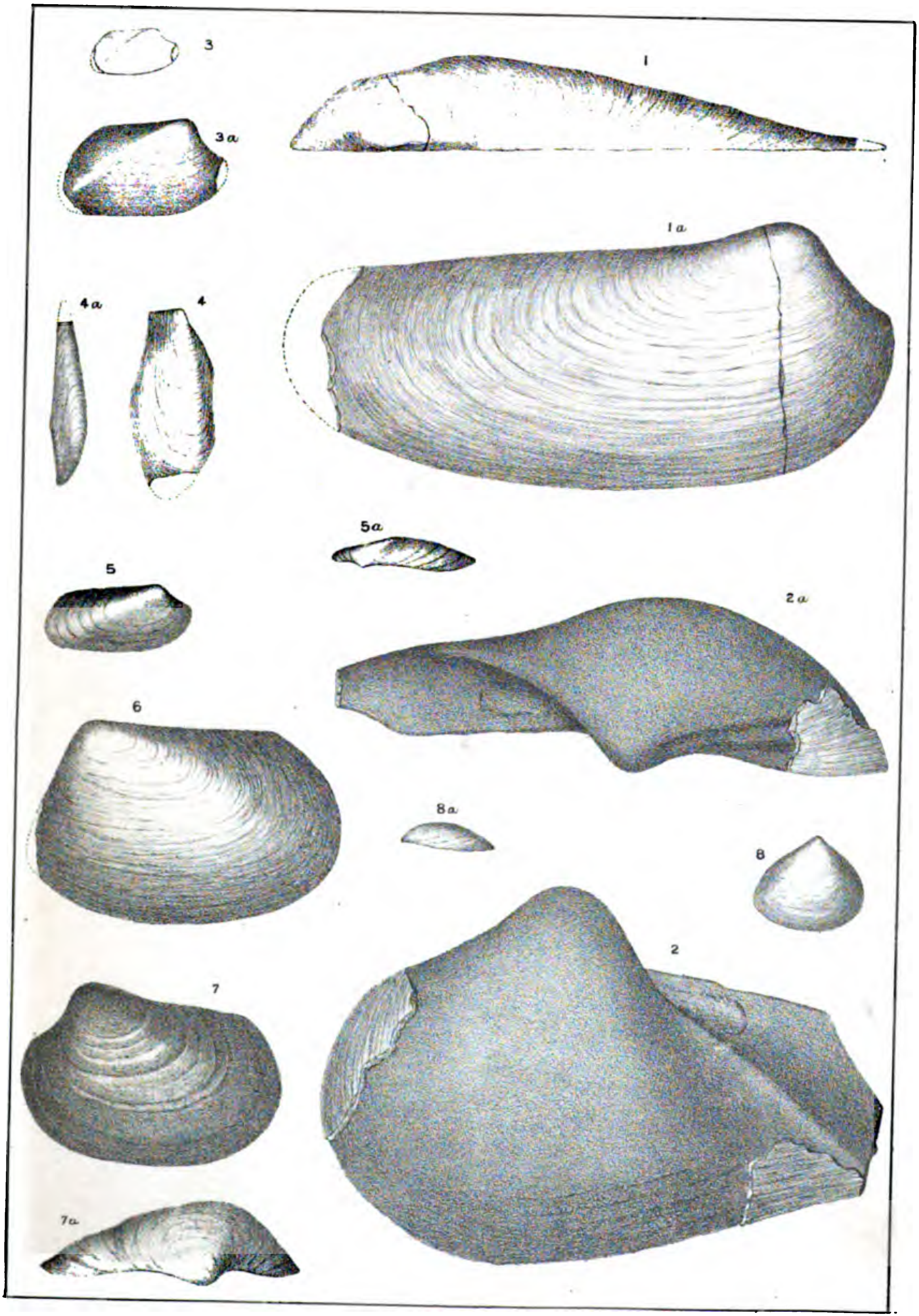
Schizodus depressus Worthen.. 109

Fig. 8. View of right valve, natural size.

Fig. 8 *a*. Dorsal view of the same.

(Lamellibranchiata.)



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CLINOPISTHA RADIATA Hall sp 122

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NUCULA ILLINOIENSIS Worthen 128

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SOLENOMYA? IOVENSIS Worthen 132

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CARDIOMORPHA? PELLENSIS Worthen 126

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Fig. 10 *a*. Outline of a transverse section.

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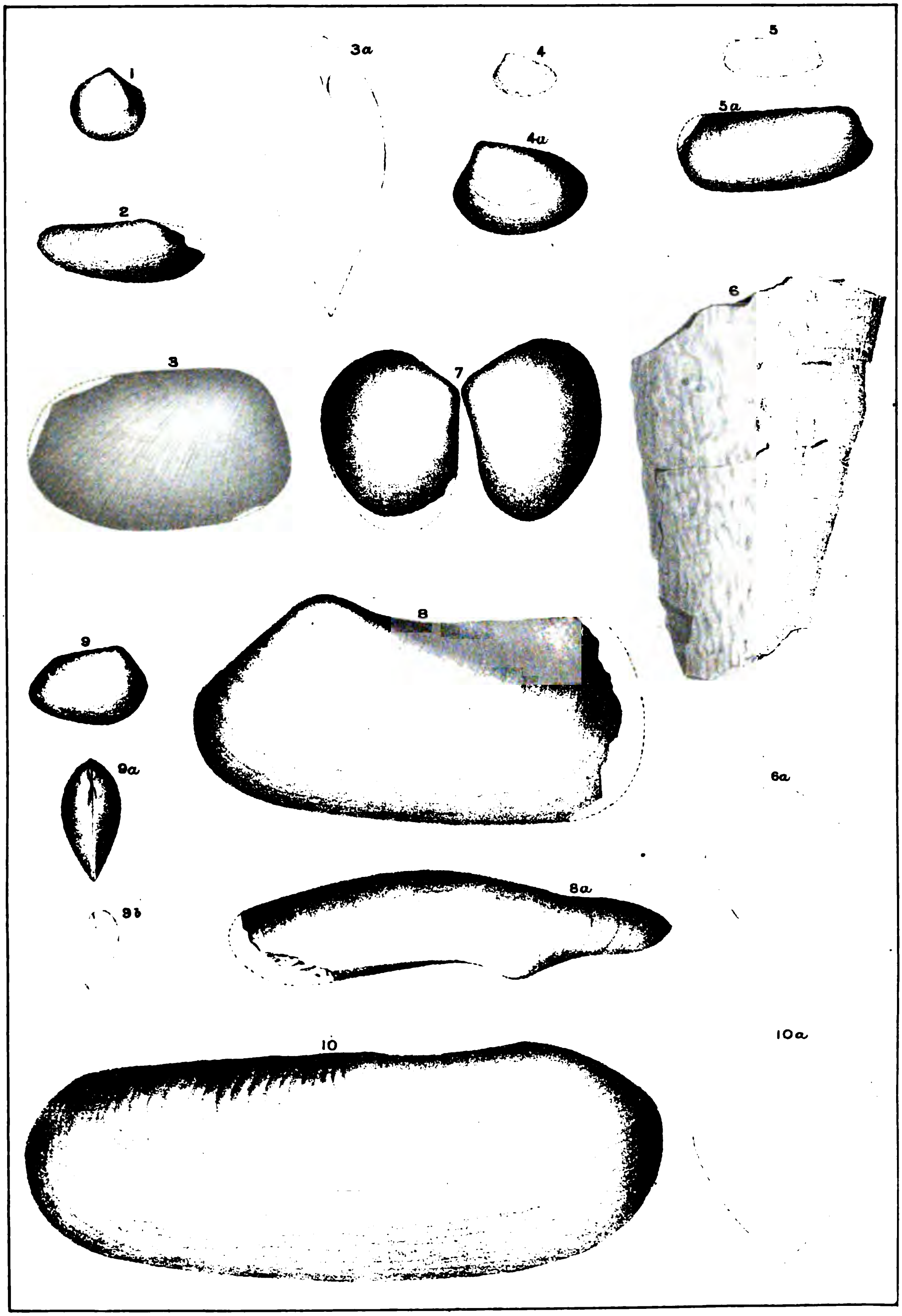

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Sanguinolites randolphensis Worthen 130

Fig. 1. View of left valve, natural size.

Fig. 1 *a*. Dorsal view of same specimen.

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Fig. 2. View of left valve, natural size.

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Pleurophorus minimus Worthen...................................... 124

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Fig. 11 *a*. Dorsal view of same.

Schizodus randolphensis Worthen.................................. 110

Fig. 12. Cast in limestone of left valve, natural size.

Lamellibranchiata.

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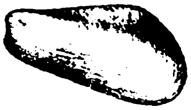

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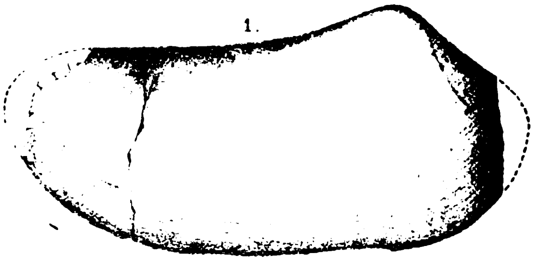

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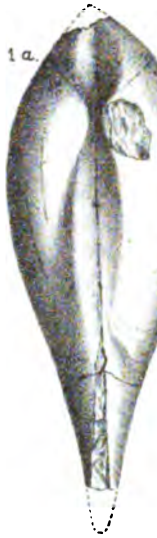

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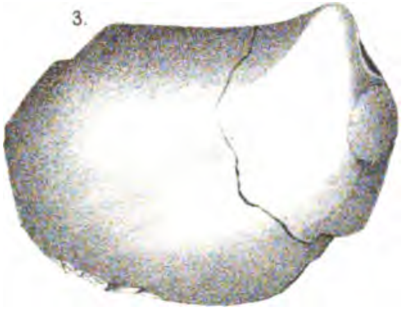

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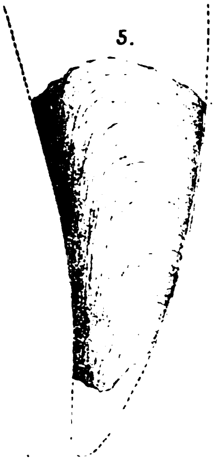

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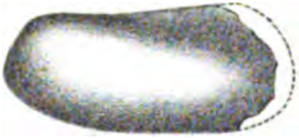

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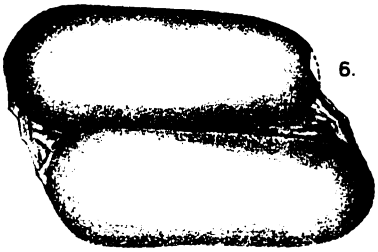

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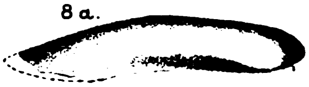

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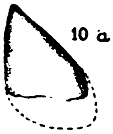

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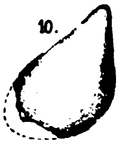

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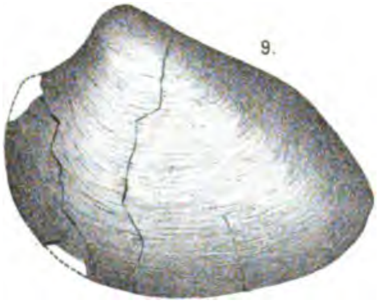

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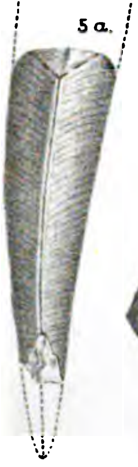

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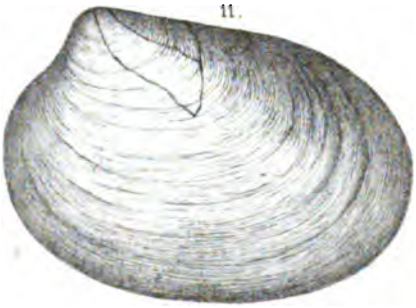

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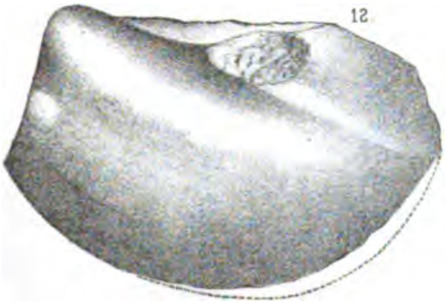

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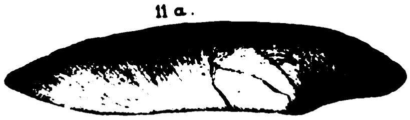

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PLATE XXI.

PAGE.

SCHIZODUS ULRICHI Worthen 110

Fig. 1. Cast of right valve showing anterior muscular scar.

Fig. 1 *a*, *b*. Interior of valves showing cardinal tooth and socket.

CLINOPISTHA RADIATA Hall, sp. 122

Fig. 2. Ventral view, showing the ligament.

MACRODON SANGAMONENSIS Worthen 123

Fig. 3. View of right valve, natural size.

Fig. 3 *a*. Dorsal view of same.

AVICULOPECTEN PROVIDENSIS Cox, sp. 116

Fig. 4. View of left valve, natural size.

Fig. 4 *a*. Lateral view of same in outline.

AVICULOPECTEN CHESTERENSIS Worthen.. 115

Fig. 5. View of a right valve, natural size.

Fig. 5 *a*. Lateral view of same in outline.

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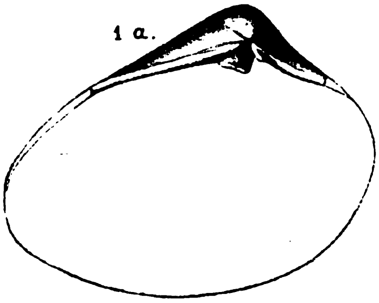

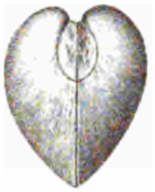

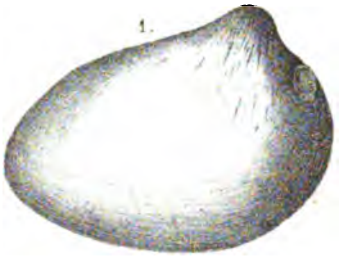

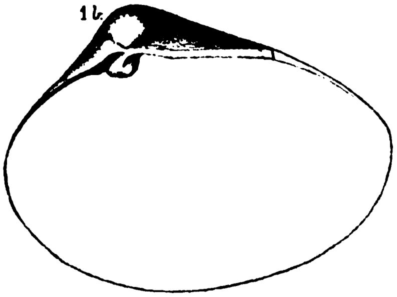

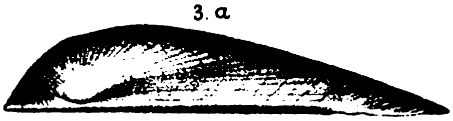

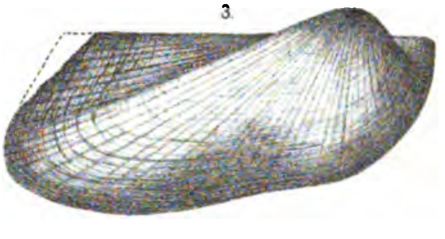

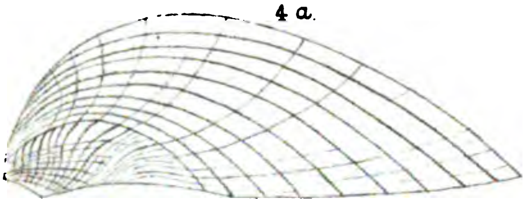

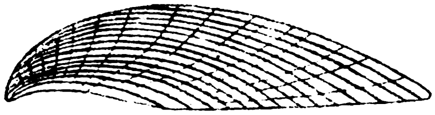

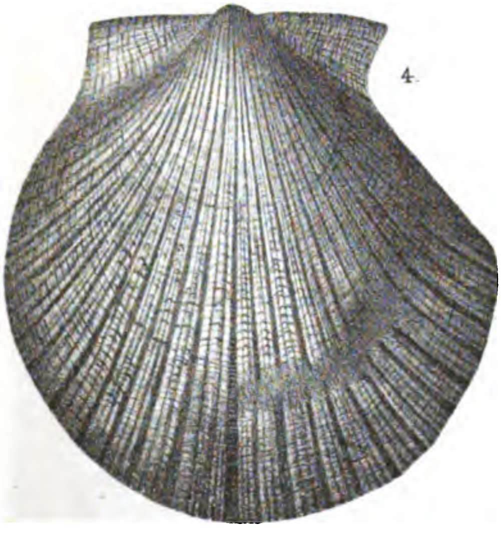

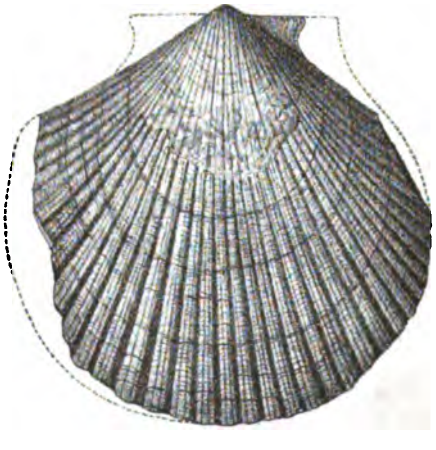

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Aviculopecten spinuliferus Meek and Worthen.................. 116
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Aviculopecten edwardsi Worthen.................................... 119
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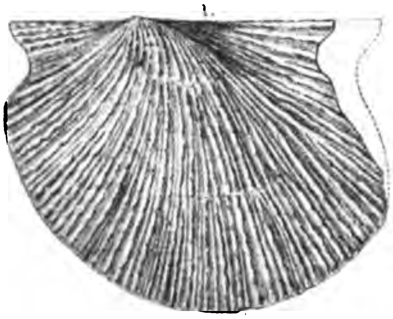
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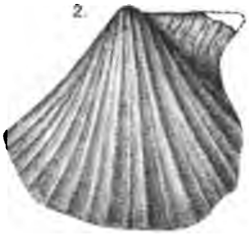
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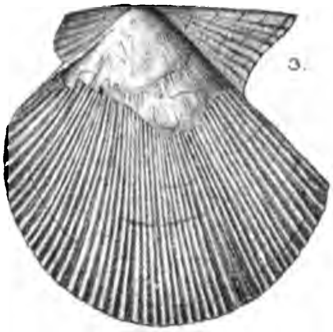
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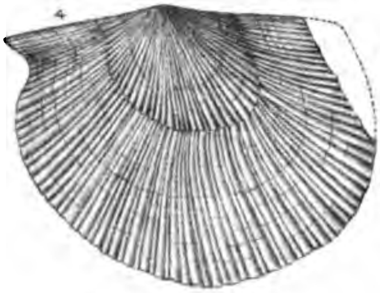
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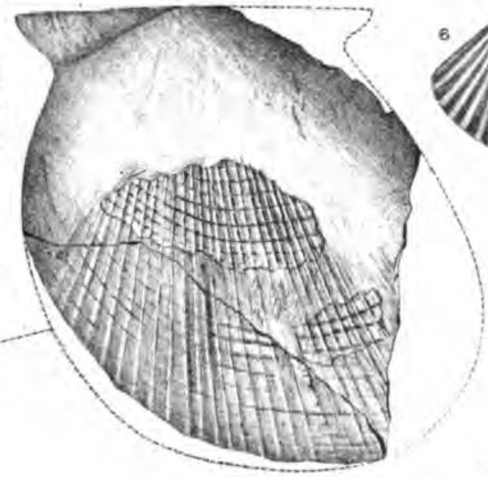
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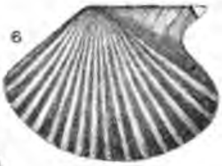
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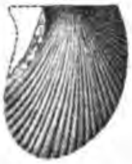
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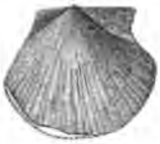
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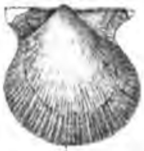
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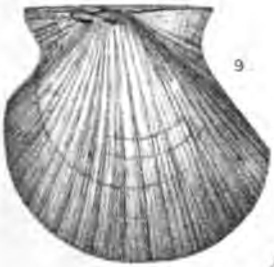
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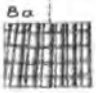
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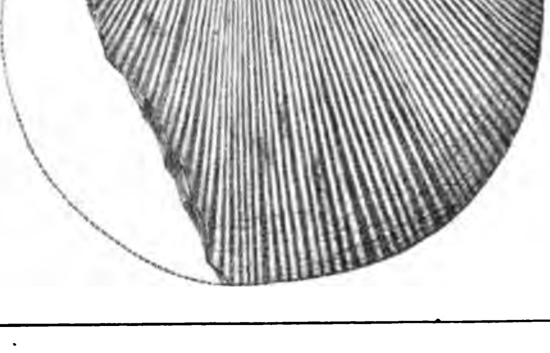
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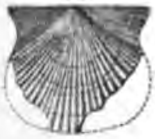
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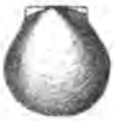
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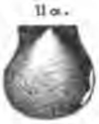
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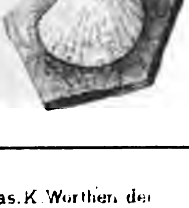
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PLATE XXIII.

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DENTALIUM ILLINOIENSE Worthen 145
Fig. 1. View of a nearly perfect specimen, natural size.

MURCHISONIA KEOKUK Worthen 141
Fig. 2. Limestone cast of a nearly perfect specimen.
Fig. 2 *a*. Fragment showing the aperture.

POLYPHEMOPSIS? KEOKUK Worthen 144
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PORCELLIA PEORIENSIS Worthen 138
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PLEUROTOMARIA ADAMSI Worthen 137
Fig. 5. View of the spire, natural size.
Fig. 5 *a*. Same enlarged 2×.

PLEUROTOMARIA ILLINOIENSIS Worthen 135
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Fig. 6 *b*. Profile view of the same.

PLEUROTOMARIA sp. undet.
Figs. 7 and 7 *a*. Dorsal view, natural size, and magnified 2×.

PLEUROTOMARIA GIFFORDI Worthen 135
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Fig. 8 *a*. Dorsal view of same.

LOXONEMA QUADRI-CARINATUM Worthen 140
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Fig. 9 *a*. View of opposite side, natural size.

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Fig. 10 *b*. Outline of the same enlarged 2×.

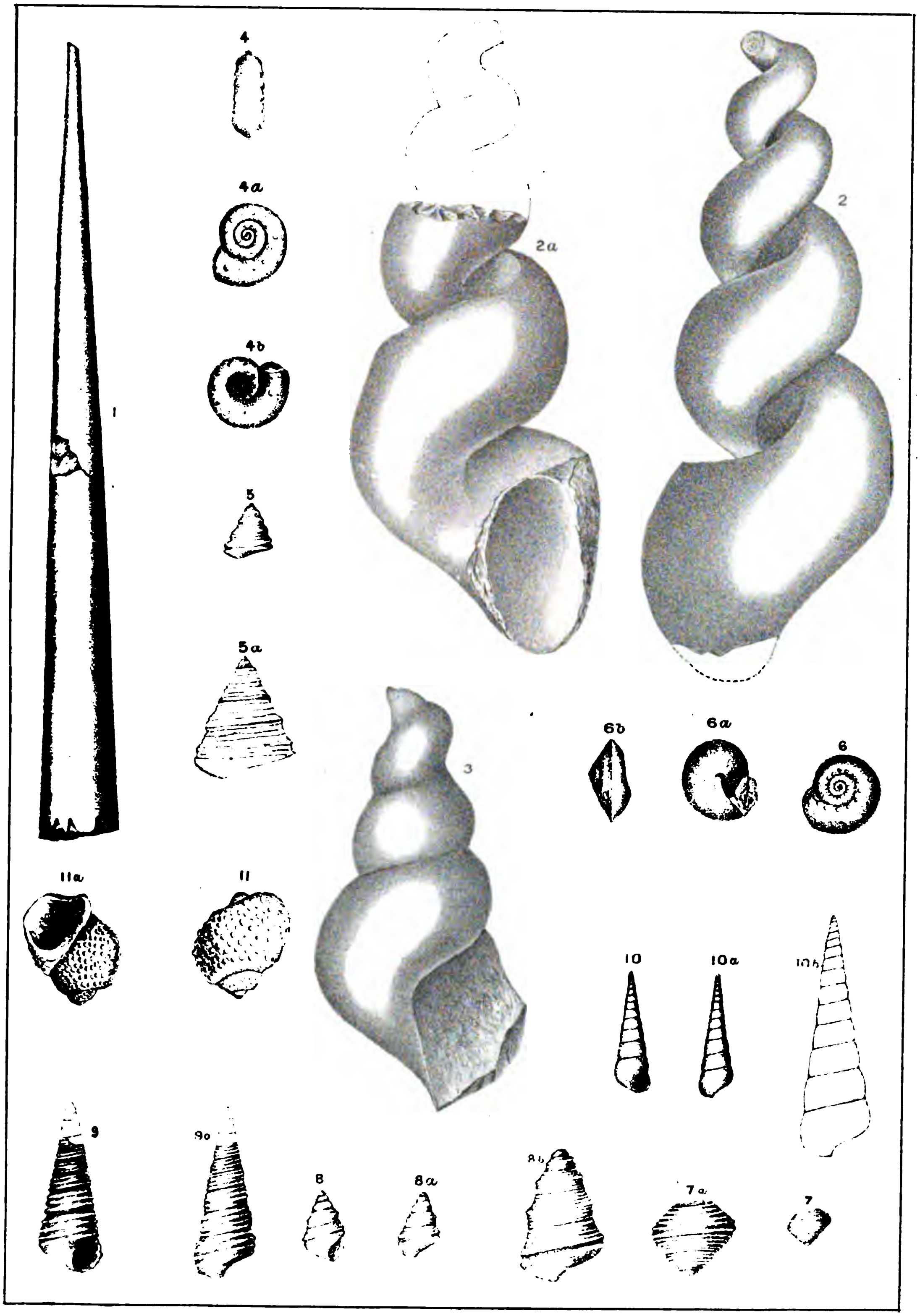
TRACHYDOMIA NODULOSA Worthen 146
Figs. 11 and 11 *a*. Opposite views of a perfect specimen, natural size.

VOL VIII.

GEOLOGICAL SURVEY OF ILLINOIS.

(Gasteropoda)

PL XXIII



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MACROCHEILUS ALTONENSE Worthen 143

Figs. 1 and 1 *a*. Opposite views of the spire, natural size.

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Fig. 2. Dorsal view of the spire, natural size.

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PLEUROTOMARIA MONTEZUMA Worthen 136

Fig. 5. View of lower volution, natural size.

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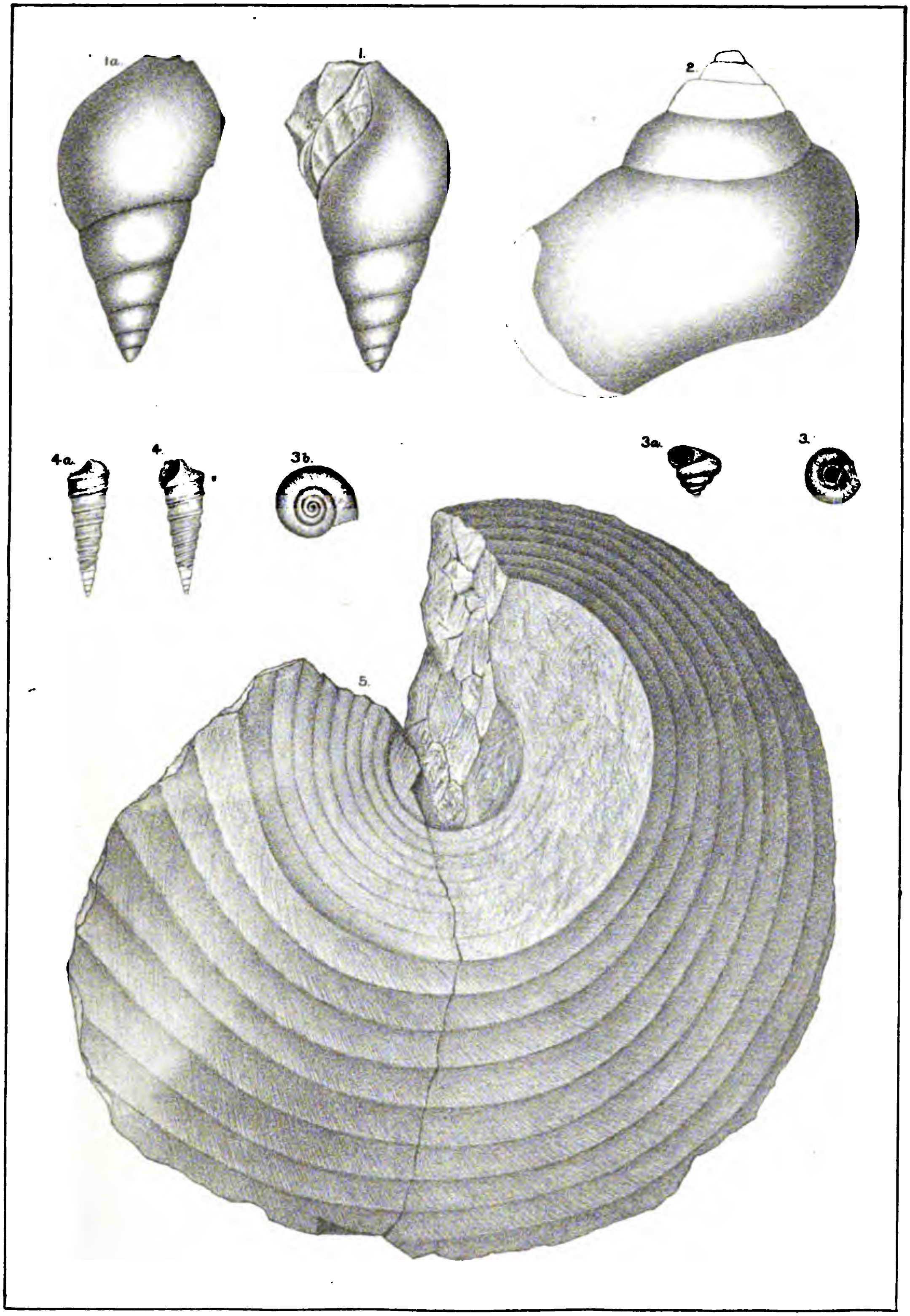
Gasteropoda.



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Lepetopsis chesterensis Worthen 140

Fig. 1. Vertical view, natural size,
Fig. 1 *a*. Lateral view of same.

Straparollus varsoviensis Worthen 142

Fig. 2. Dorsal view natural size.
Fig. 2 a. Profile view of same.

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Fig. 3. Limestone cast natural size,

Naticopsis madisonensis Worthen 144

Fig. 4. Profile view natural size.
Fig. 6. Opposite view of same.

Bellerophon giganteus Worthen 143

Fig. 5. Dorsal view natural size.
Fig. 5 *a*. Lateral view of same.

Murchisonia lasallensis Worthen 141

Fig. 7. View of spire natural size.
Fig. 7 *a*. Outline view of same enlarged 2×.

Gasteropoda.

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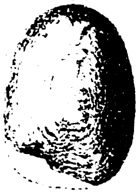

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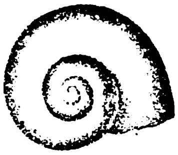

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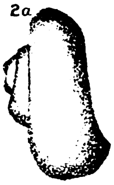

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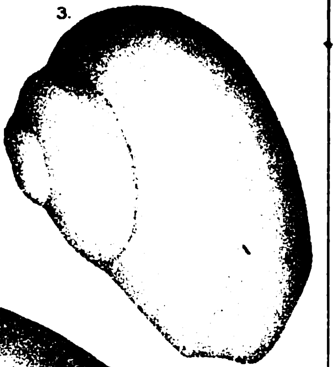

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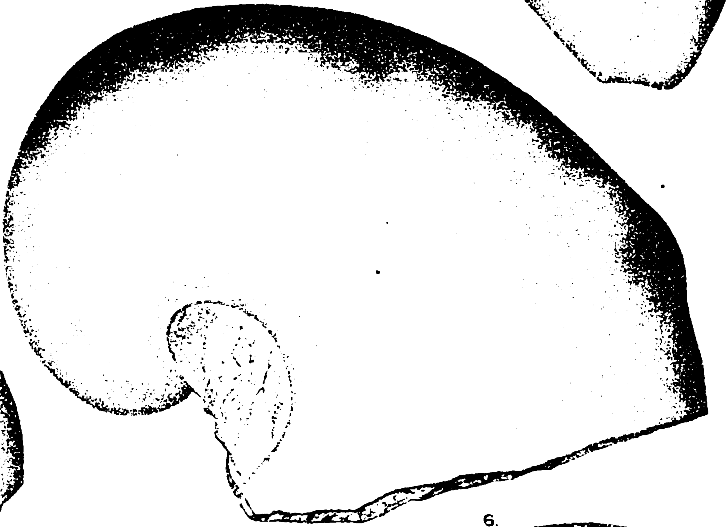

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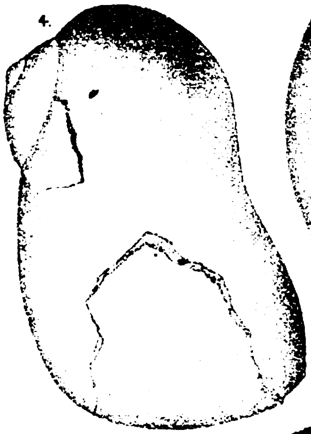

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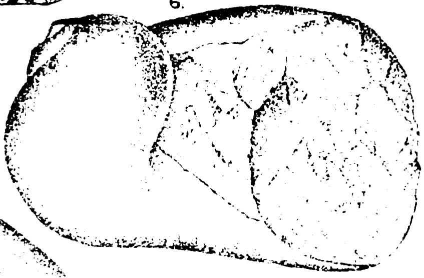

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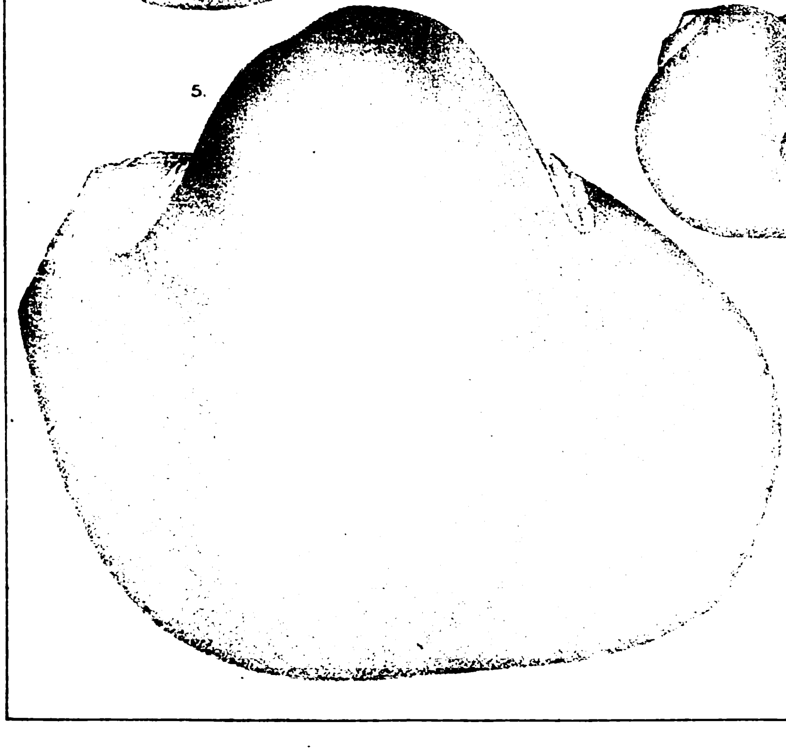

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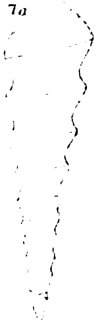

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ORTHOCERAS ILLINOIENSE Worthen 148

Fig. 1. View of outer chamber with septa attached.

Fig. 1 *a*. View septate portion.

Fig 1 *b*. Transverse section showing position of siphuncle.

NAUTILUS MONTGOMERYENSIS Worthen.. 148

Fig. 2. Lateral view; natural size.

ORTHOCERAS OKAVENSE Worthen.. 149

Fig. 3. View of a nearly perfect specimen; natural size.

ORTHOCERAS LASALLENSE Worthen.. 149

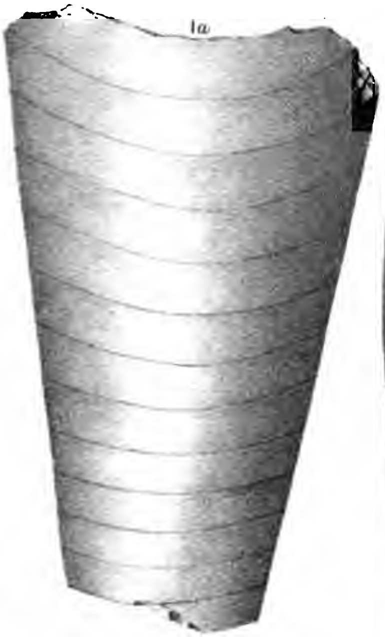
Fig. 4. View of a specimen natural size.

Fig. 4 *a*. Fragment of the test enlarged 2×.

GONIATITES MONROENSIS Worthen.. 150

Fig. 5. Lateral view showing form of the septæ.

[Cephalopoda.]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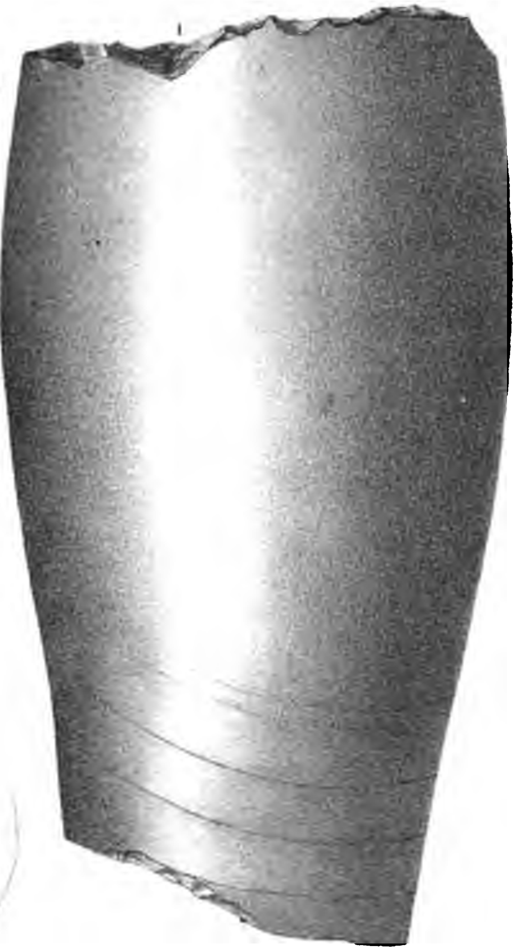
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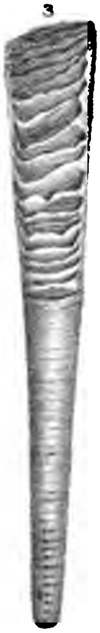
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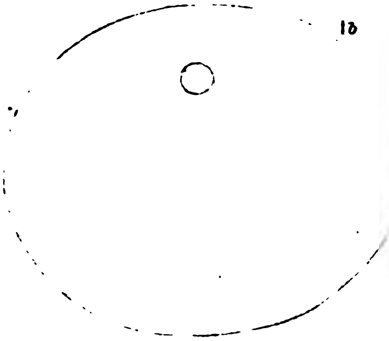
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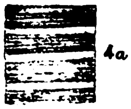
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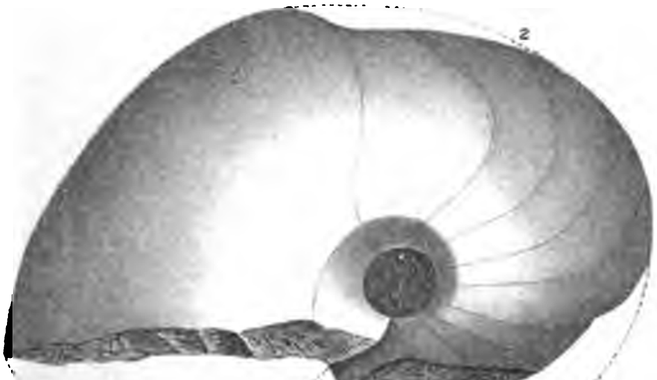
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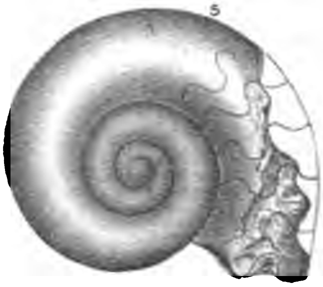
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PLATE XXVII.

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Nautilus montgomeryensis Worthen 148

Fig 1. Dorsal view showing form of the septa.

Ascoceras southwelli Worthen 151

Fig. 2. Side view natural size.

Fig. 2 *a*. End view showing position of siphuncle.

Temnocheilus scottense Worthen.................................... 151

Fig. 3. Lateral view natural size.

Fig. 3 *a*. Profile view of same.

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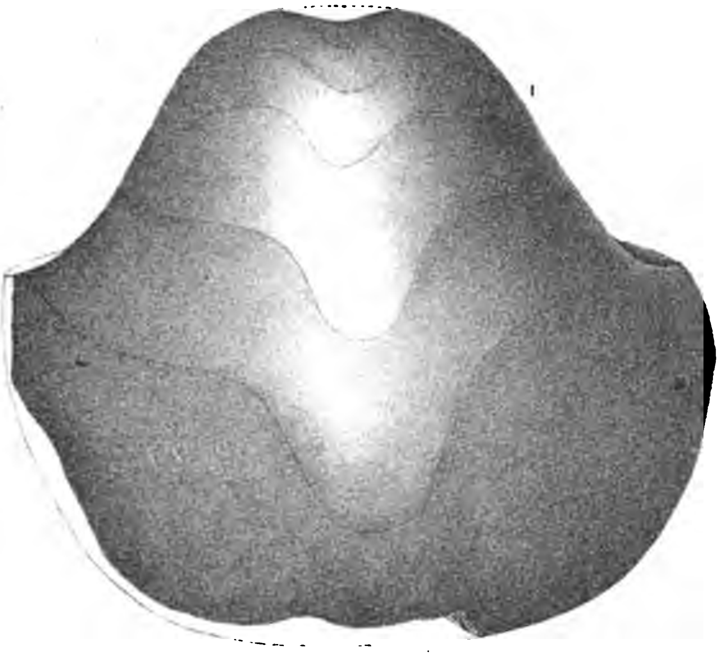
(Cephalopoda.)



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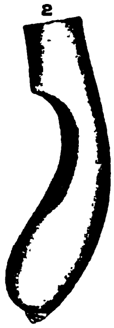

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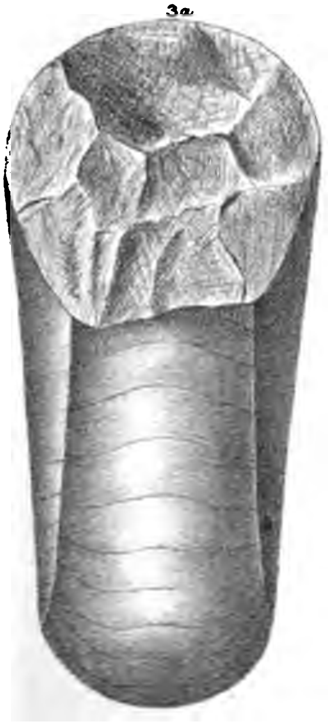

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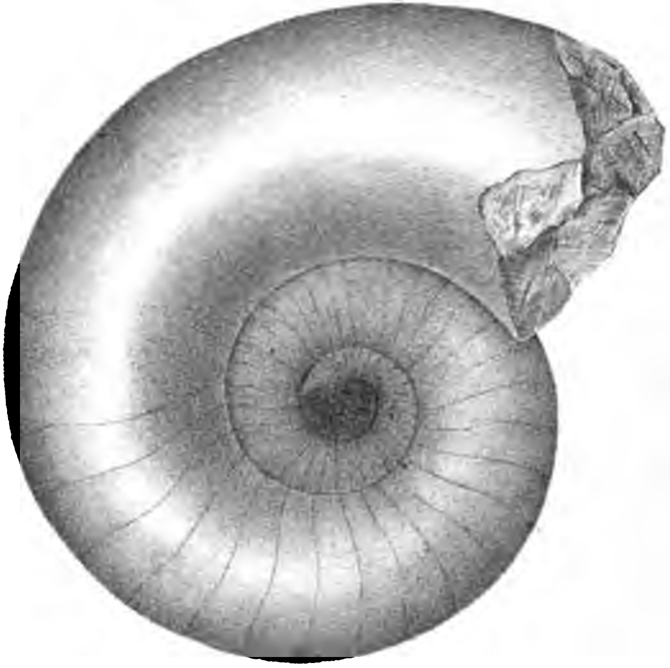

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PLATE XXVIII.

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Solenocheilus (?Endolobus) indianense Worthen 150

Fig. 1. Lateral view, natural size.

Fig. 1 *a*. Outline view of septate portion.

Colpocaris chesterensis Worthen 153

Fig. 2. View of a carapace valve, natural size.

Solenocaris sancti-ludovici Worthen 153

Fig. 3. View of carapace valve, natural size.

GEOLOGICAL SURVEY OF ILLINOIS.

Cephalopoda & Crustacea.

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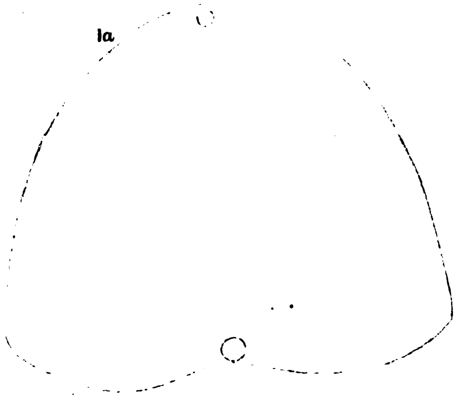

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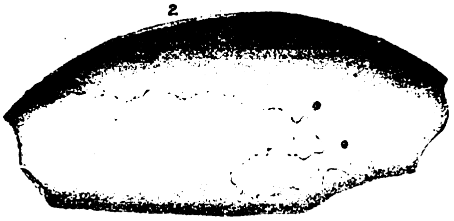

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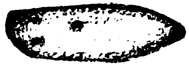

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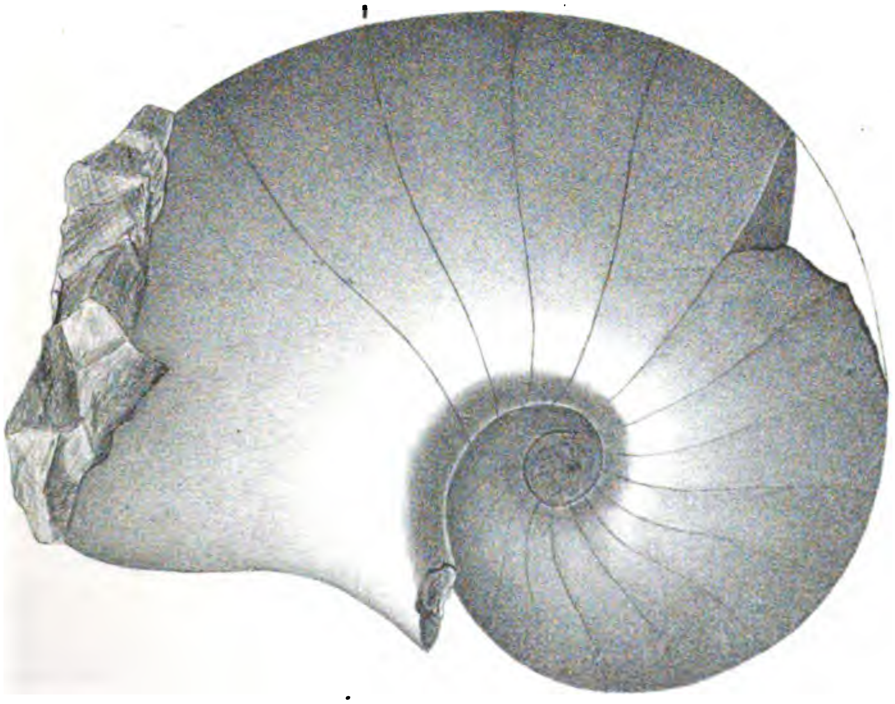

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PLATE XXIX.

PAGE

Fig. 1. PHACELOPORA PERTENUIS Ulr. 406

1. A portion of the zoarium. Natural size.
1 *a.* Several segments, x 25.
1 *b.* Vertical section, x 25.
1 *c.* Transverse section showing relative size and position of the aperture, and the small lucid spot above, x 50.

Top of Trenton or base of Cincinnati group, Alexander County, Ill. Illinois State Museum.

Fig. 2. PHACELOPORA CONSTRICTA Ulr. 406

The type specimen natural size and magnified 25 times.
Trenton limestone, Burgin, Ky. E. O. Ulrich.

Fig. 3. PHYLLOPORINA GRANISTRIATA Ulr 639

3. An example showing reverse, nat. size.
3 *a.* Portion of same, x 18, showing character of reverse.

Top of Trenton, Alexander Co., Ill. Illinois State Museum.

Fig. 4. PROTOCRISINA EXIGUA Ulr. (See also Pl. LIII.) 405

4. Two examples of the nat. size.
4 *a.* Poriferous side, showing arrangement of apertures and accessory pores, x 18.
4 *b.* Non poriferous side, x 18.
4 *c.* Transverse section, x 18.

Cincinnati group, Wilmington, Ill. Illinois State Museum.

Fig. 5. HELOPORA IMBRICATA Ulr 644

Lower portion of a segment, x 18.
Cincinnati group, Wilmington, Ill. Illinois State Museum.

Fig. 5 *a.* HELOPORA FRAGILIS Hall. (See also fig. 18, in text.) 643

The ordinary appearance of a transverse section of this species.
Clinton group, Flamborough Head, Canada.

Fig. 6. ARTHROCLEMA ANGULARE Ulr. 641

6. One of the primary segments. Natural size, and x 12.
6 *a* and 6 *b.* The upper and lower extremities of one of the secondary segments, x 18. At the left of fig. 6*a* it is shown in natural size.

Cincinnati group, Wilmington, Ill. Illinois State Museum.

Fig. 6 *c.* ARTHROCLEMA PULCHELLUM Billings 642

A transverse section of a primary segment, x 18. At the upper side the section passes through the "socket."

Plate XXIX—*Continued.*

Fig. 7. **NEMATOPORA LINEATA** Billings 646
7. A branch. Natural size.
7 *a*. Portion of same x 18.
7 *b*. Vertical section, x 18.
7 *c* and 7 *d*. Two transverse sections, x 18, the first abnormal.
7 *e*. Portion of 7*d*, x 50, to show the minute axial tubes and wall structure.
Anticosti Island.

Fig. 8. **NEMATOPORA ALTERNATA** Ulr 646
8 and 8a. Branch, natural size, and a portion, x 18.
Top of Trenton, Alexander Co., Ill. Illinois State Museum.

Fig. 9. **NEMATOPORA RETRORSA** Ulr 645
9 and 9 *a*. Fragment. Natural size, and a portion, x 18.
9 *b*. Nertical section, x 18.
Top of Trenton, Alexander Co., Ill. Illinois State Museum.

Fig. 10. **NEMATOPORA FRAGILIS** Ulr 646
10. A fragment, showing mode of branching. Natural size.
10 *a*. Portion of same, x 18.
10 *b*. Vertical section, x 18. 10 *c*. Transverse section, x 50.
Top of Trenton, Alexander Co., Ill. Illinois State Museum.

Fig. 11. **NEMATOPORA DELICATULA** Ulr 646
11. A complete example. Natural size.
11 *a*. The basal portion x 18.
11 *b*. Transverse section, x 50.
Alexander Co., Ill. Illinois State Museum.

Fig. 12. **NEMATOPORA QUADRATA** Ulr 644
12. A branch. Natural size.
12 *a*. Portion of same, x 18.
12 *b*. Vertical section, x 18.
12 *c*. Transverse section, x 50.
Trenton limestone, Trenton Falls, N. Y. E. O. Ulrich.

[Silurian Bryozoa.]

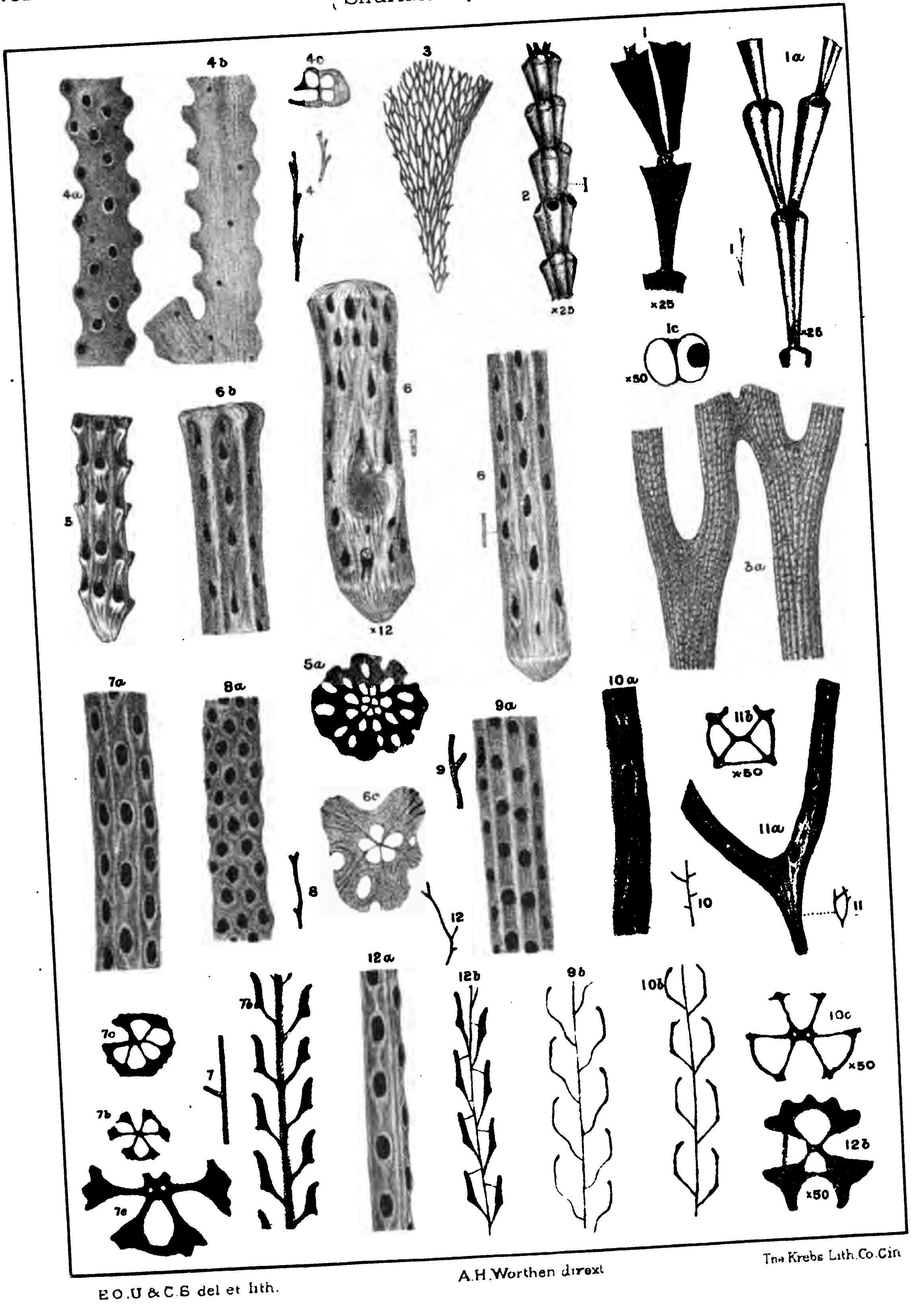

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PLATE XXX.

PAGE.

Fig. 1. Ptilotrypa obliquata Ulr. 531
1. A fragment of the species. Natural size.
1 *a*. Surface of same x12.
1 *b*. Tangential section showing usual characters and accessory pores.
1 *c*. Vertical section. Natural size.
1 *d*. Portion of same x18.
1 *e*. Transverse section x18.
Cincinnati group, Will Co., Ill.
Illinois State Museum.

Fig. 2. Eurydictya sterlingensis Ulr. 522
2. A fragment. Natural size.
2 *a*. Portion of surface x12.
Cincinnati group, Sterling, Ill.
Illinois State Museum.

Fig. 3. Eurydictya montifera Ulr. 521
3. A frond showing distribution and character of monticules.
3 *a*. Surface of same x12.
3 *b*. Tangential section x18.
3 *c*. Half of a vertical section of a frond x18. Shows a third layer of cells on the righ
3 *d*. Half of a transverse section, x18, showing median tubuli.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 4. Eurydictya calhounensis Ulr. 520
4. Fragment of a frond. Natural size.
4 *a*. Surface x18. The solid monticule is an usual feature.
4 *b*. Tangential section x18.
4 *c*. Portion of a vertical section x18.
Trenton limestone, Calhoun Co., Ill.
Illinois State Museum.

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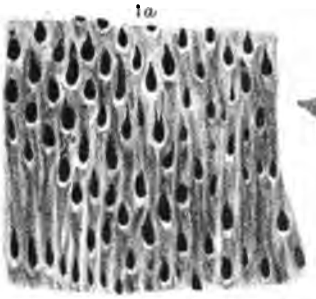
(Silurian Bryozoa.)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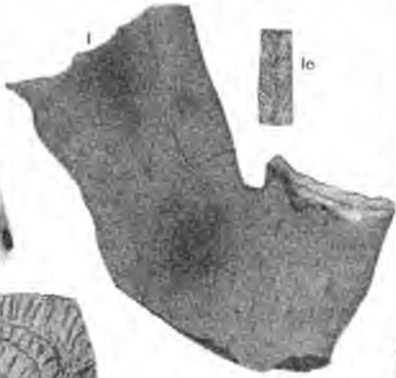
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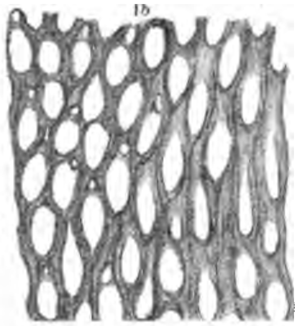
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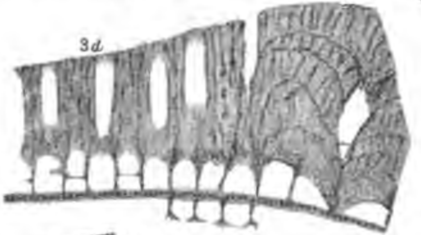
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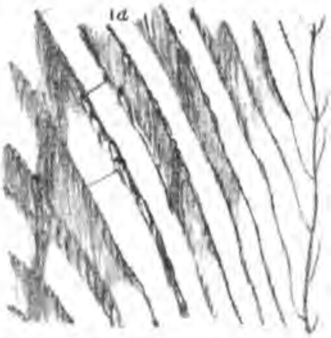
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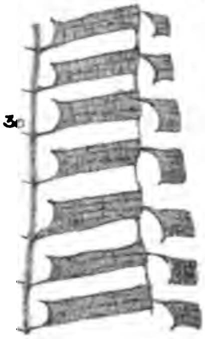
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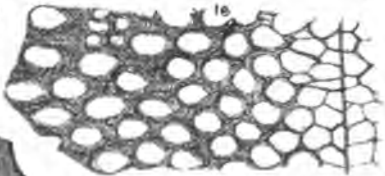
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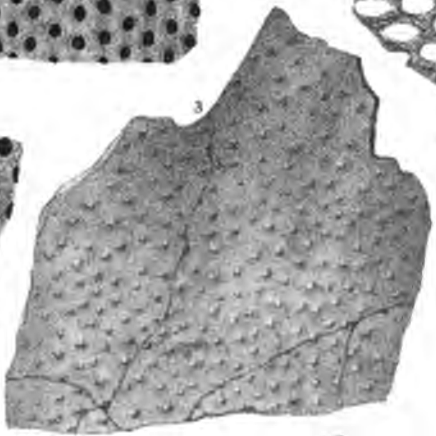
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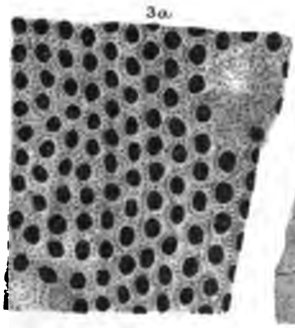
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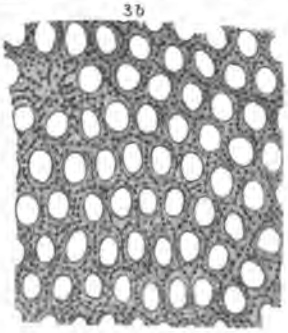
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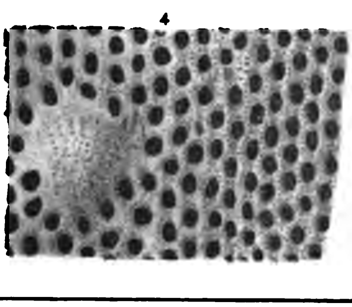
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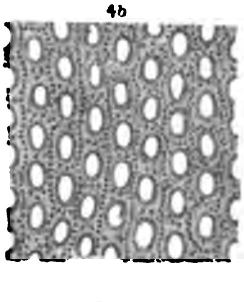
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PLATE XXXI.

PAGE.

Fig. 1. Pachydictya fenestelliformis var. corticula Ulr. 526

1. A nearly perfect example of this species. Natural size.
Cincinnati group, Wilmington. Ill.
Illinois State Museum.

Fig. 2. Pachydictya firma Ulr. 525

2. A twisted example, with a transverse section of same. Natural size.

2 *a*. Surface of same x12.

2 *b* and 2 *e*. A vertical section. Natural size, and a portion x12.

2 *c* and 2 *d*. Tangential sections x18. The first divides the zoarium just beneath the surface; the second just above the median laminæ.

2 *f*. Transverse section x25. Showing median tubuli.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 2 g. Pachydictya splendens Ulr. (See also Pl. XXXII) 523

A specimen of the species which was at first supposed to belong to *P. firma*.

Fig. 3. Pachydictya gigantea Ulr. 524

3. Example of the natural size and section to show its thickness.

3 *a*. Surface of same x12. The apertures often appear smaller and the walls thicker than shown here.

3 *b*. A deep tangential section showing the median tubuli below and the character of the zoœcia just above the central laminæ x18.

3 *c*. A tangential section passing through the zoarium just beneath the surface x18. Part of one of the solid maculæ is shown at lower left hand corner.

3 *d*. Transverse section x18.

3 *e*. Vertical sectio .
C oup, Wilmington, Ill.
Illinois State Museum.

[Silurian Bryozoa.]

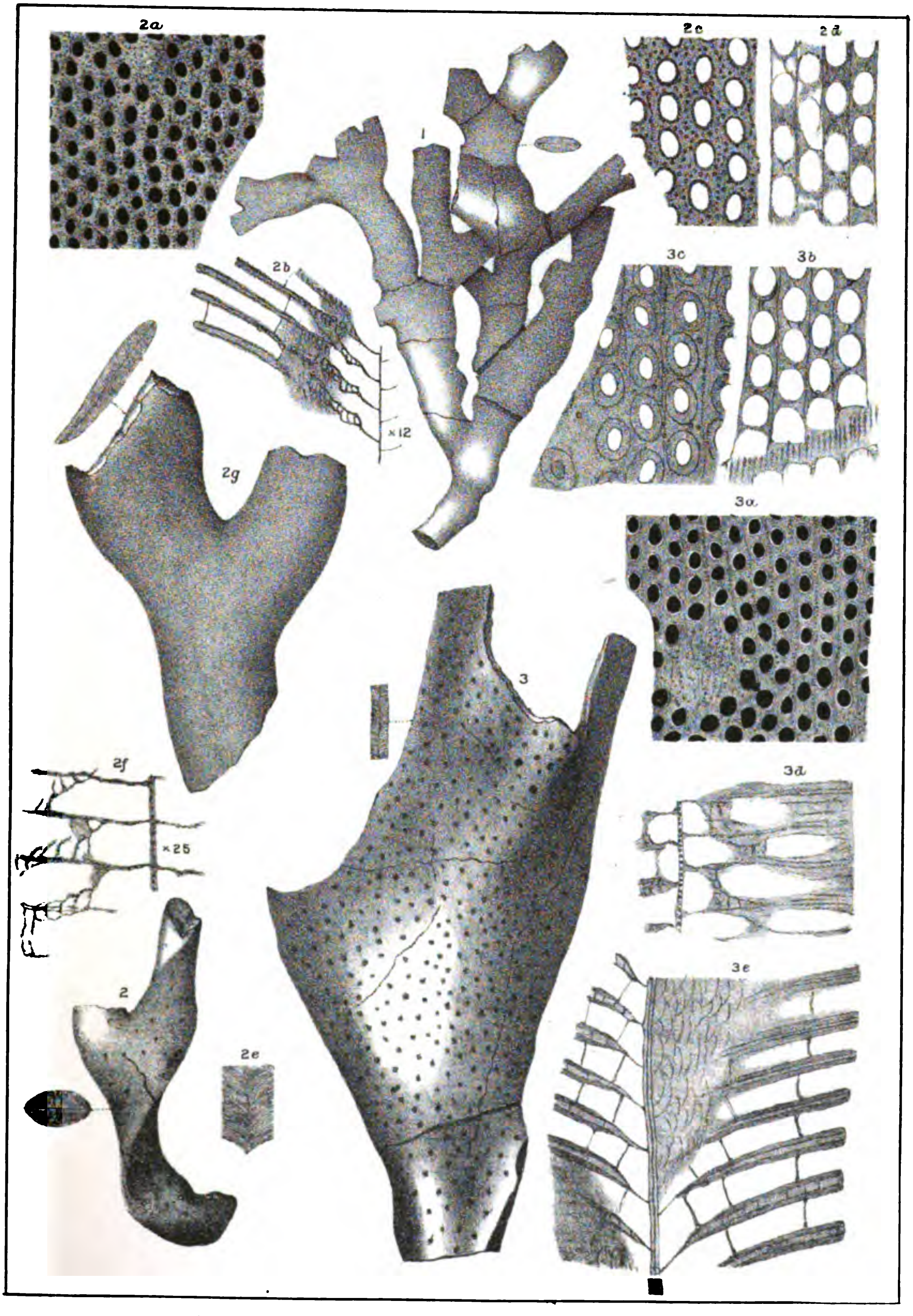

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PLATE XXXII.

PAGE.

Fig. 1. Pachydictya splendens Ulr. 523
1. An example of the ordidary size and shape, natural size.
1 *a.* Surface of same x12.
1 *b.* Tangential section cutting the zoarium just beneath the surface x18.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 2. Homotrypa gelasinosa Ulr. 410
2. View of type specimen showing arrangement of the dimple like maculæ.
2 *a.* Surface of same x12.
2 *b.* Tangential section x18.
2 *c* and 2 *d.* Vertical section natural size and a portion x18.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 3. Homotrypa flabellaris Ulr. 411
3. A nearly complete example, natural size.
3 *a.* Surface of same x12.
3 *b.* Tangential section x18.
3 *c.* Vertical section showing the thin wavy walls and large cystiphragms x18.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 4. Monticulipora lamellosa Ulr. 408
4. Portion of the surface of a mass several inches in diameter x12.
4 *a.* Tangential section of the usual appearance x18.
4 *b.* Part of a vertical section, showing one layer complete and portions of two others x18. The walls have the peculiar structure common to the genus.
Cincinnati group, Wilmington, Ill.

Fig. 5. Homotrypella contexta Ulr. 412
5. The type specimen of the natural size.
5 *a.* Tagential section of same, showing the rounded zoœcia with their small acanthopores and cystiphragms, and the anugular mesopores x18.
5 *b.* Vertical section of same x18. The zoœcial tubes have a series of cystiphragms, while the mesopores only have straight diaphragms.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

[Silurian Bryozoa.]

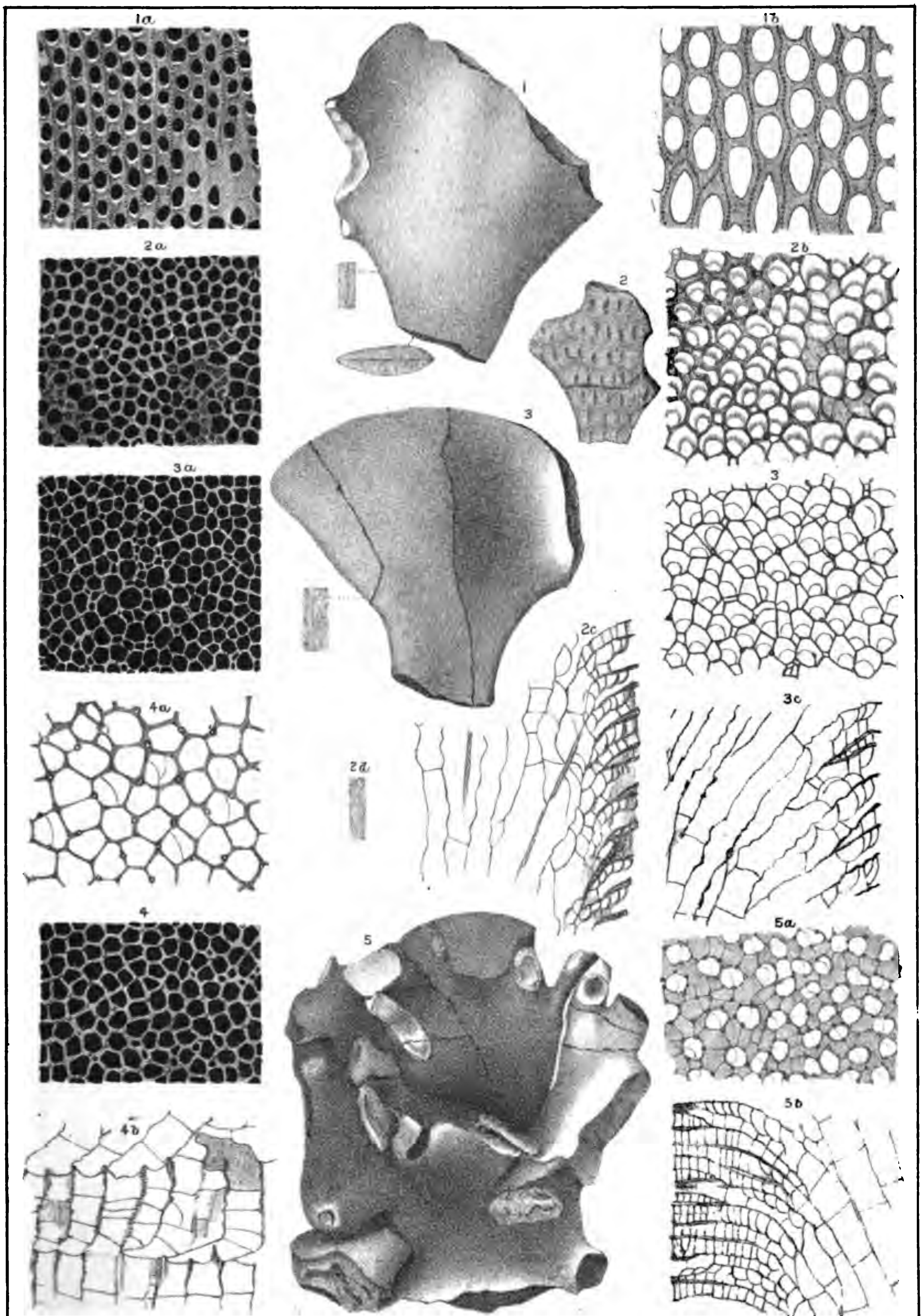

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PLATE XXXIII.

PAGE.

Fig. 1. PACHYDICTYA EVERETTI Ulr. 523
1. An example of the natural size.
1 *a*. The surface of same, x12.
1 *b* and 1 *c*. Two portions of a tangential section, which divides the zoœcia at different levels, the first showing their character near the surface, the latter just above the median laminæ.
1 *d*. A small portion of 1 *c* x50, to show the median tubuli in the cell walls.
1 *e*. Vertical section, x18.
1 *f*. A small portion of a transverse section showing the large median tubuli and thin median laminæ, x50.
Trenton limestone, Dixon, Ill.
Collection of E. O. Ulrich.

Fig. 2. DIPLOTRYPA PATELLA Ulr 458
2. An example of the ordinary size.
2 *a*. Sectional view of same to show its thickness. Natural size.
2 *b*. Surface of same, x12.
2 *c*. Tangential section, x18,
2 *d*. Small portion of a vertical section, x18.
Cincinnati group, Oxford, Ohio.
E. O. Ulrich's collection.

Fig. 3. DIPLOTRYPA? DUBIA Ulr.. 459
3. Tangential section of this species, x18.
3 *a*. A small portion of same to show wall structure and mesopores, x50.
3 *b*. Several tubes of a vertical section, x18.
Cincinnati group, Wilmington, Ill.
E. O. Ulrich's collection.

Fig. 4. CALLOPORELLA NODULOSA Ulr.. 418
4. The only example seen. Natural size. It is attached to a fragment of *Strophomena*.
4 *a*. Surface of same,' x12.
Illinois State Museum.

Fig. 5. CALLOPORA SUBNODOSA Ulr 417
5. A fragment of the ordinary size and usual character. Natural size.
5 *a*. Surface of same, x12.
5 *b*. Tangential section, x18. The right half cuts the cells nearer the surface than the left.
5 *c*. Portion of vertical section, showing the tabulation of the tube s, x18.
Cincinnati group, Blanchester, Ohio.
E. O. Ulrich's collection.

Plate XXXIII—*Continued.*

PAGE.

Fig. 6. NICHOLSONELLA CUMULATA Ulr. 423

6. A fragment showing the usual external features of the species. It is hollow and consists of several layers. Natural size.

6 *a*. Surface of same, x12. More perfect examples recently obtained show that the interspaces between the zoœcia apertures are minutely granulose.

6 *b*. Tangential section, x18.

6 *c*. Vertical section representing part of a layer, much thicker than usual, x18.

Cincinnati group, Wilmington, Ill.
Illinois State Museum.

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GEOLOGICAL SURVEY OF ILLINOIS.

[Silurian Bryozoa.]

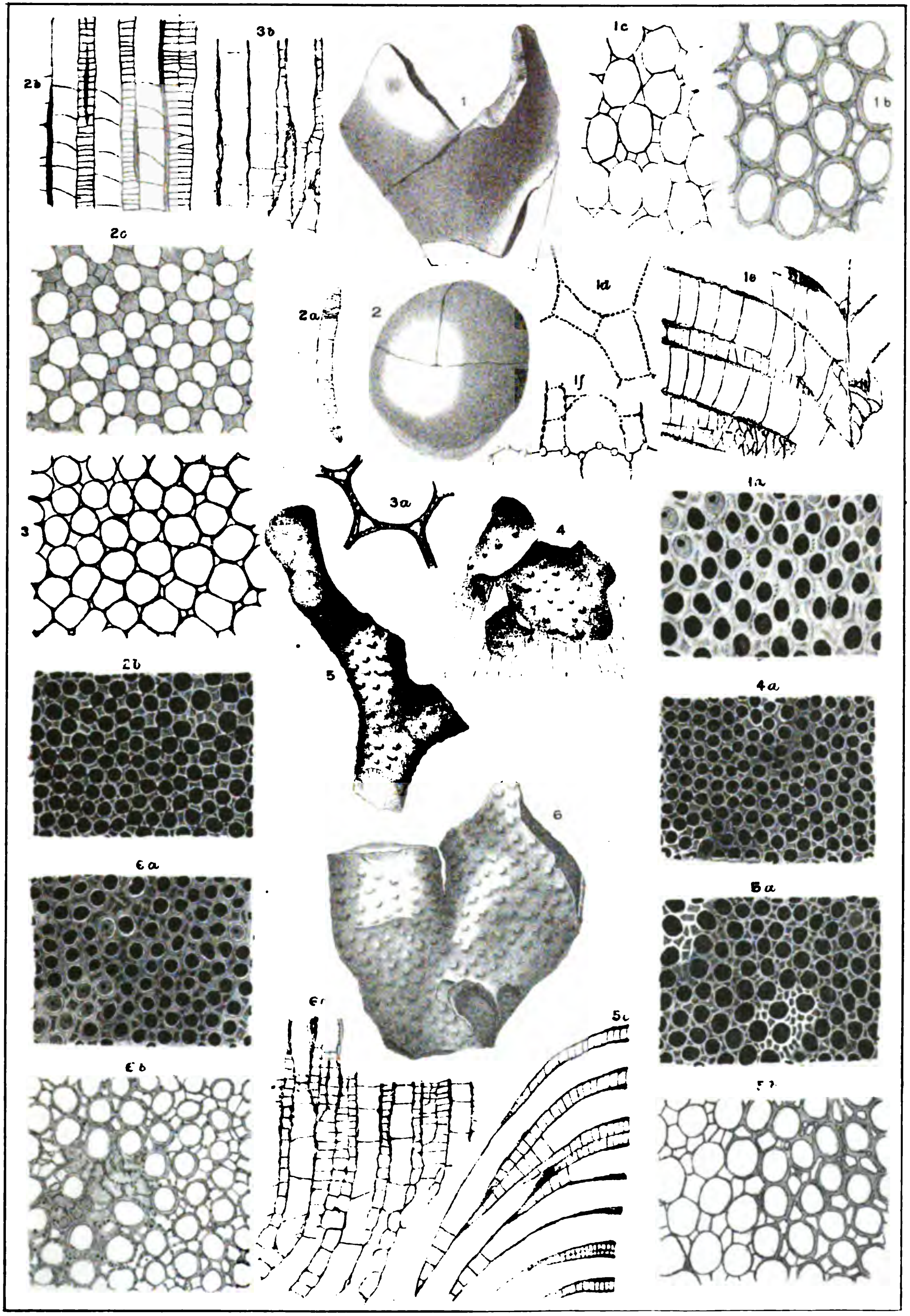

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PLATE XXXIV.

PAGE.

Fig. 1. CONSTELLARIA PARVA Ulr. 424

1. A fragment, of the natural size.
1 *a*. Tangential section x18, showing the arrangement of the zoœcia and mesopores, around one of the stellate maculæ.
1 *b*. Vertical section x18, showing the tabulation of the zoœcia and mesopores.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 2. TREMATOPORA? NITIDA Ulr. 419

2, 2 *a* and 2 *b*. Four fragments of this species. Natural size.
2 *c*. The surface x12, showing the form of the small zoœcia apertures.
Cincinnati group, Savannah, Ill.
Illinois State Museum.

Fig. 3. TREMATOPORA DEBILIS Ulr. 419

3 and 3 *a*. Two fragments of this species, showing its mode of branching. Natural size.
3 *b*. Surface x12.
3 *c*. Tangential section x18, showing character of zoœcia interspaces, and small acanthopores.
3 *d*. Vertical section x18. The mark at the bottom of the figure indicates the center of the branch.
Top of Trenton, Alexander County, Ill.
Illinois State Museum.

Fig. 4. LEIOCLEMA? WILMINGTONENSE Ulr. 426

4. Fragment, natural size.
4 *a*. Tangential section x18.
4 *b*. Vertical section x18. The section passes a little obliquely through the branch, causing the tubes to appear interrupted.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 5. NICHOLSONELLA PONDEROSA Ulr. 422

5. An example of this species showing its regular mode of growth. Natural size.

Plate XXXIV.—*Continued.*

PAGE.

5 *a*. The surface of same x12, showing its appearance when not abraded.
b. The outer portion of a vertical section x18.
5 *c*. Tangential section x18, showing the characters of the zooecia and mesopores in the zones where the latter are not entirely filled with the secondary deposit.
d. Tangential section x18, showing the appearance where the section passes through one of the solid zones.
Trenton limestone, Dixon, Ill.
E. O. Ulrich's collection.

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[Silurian Bryozoa]

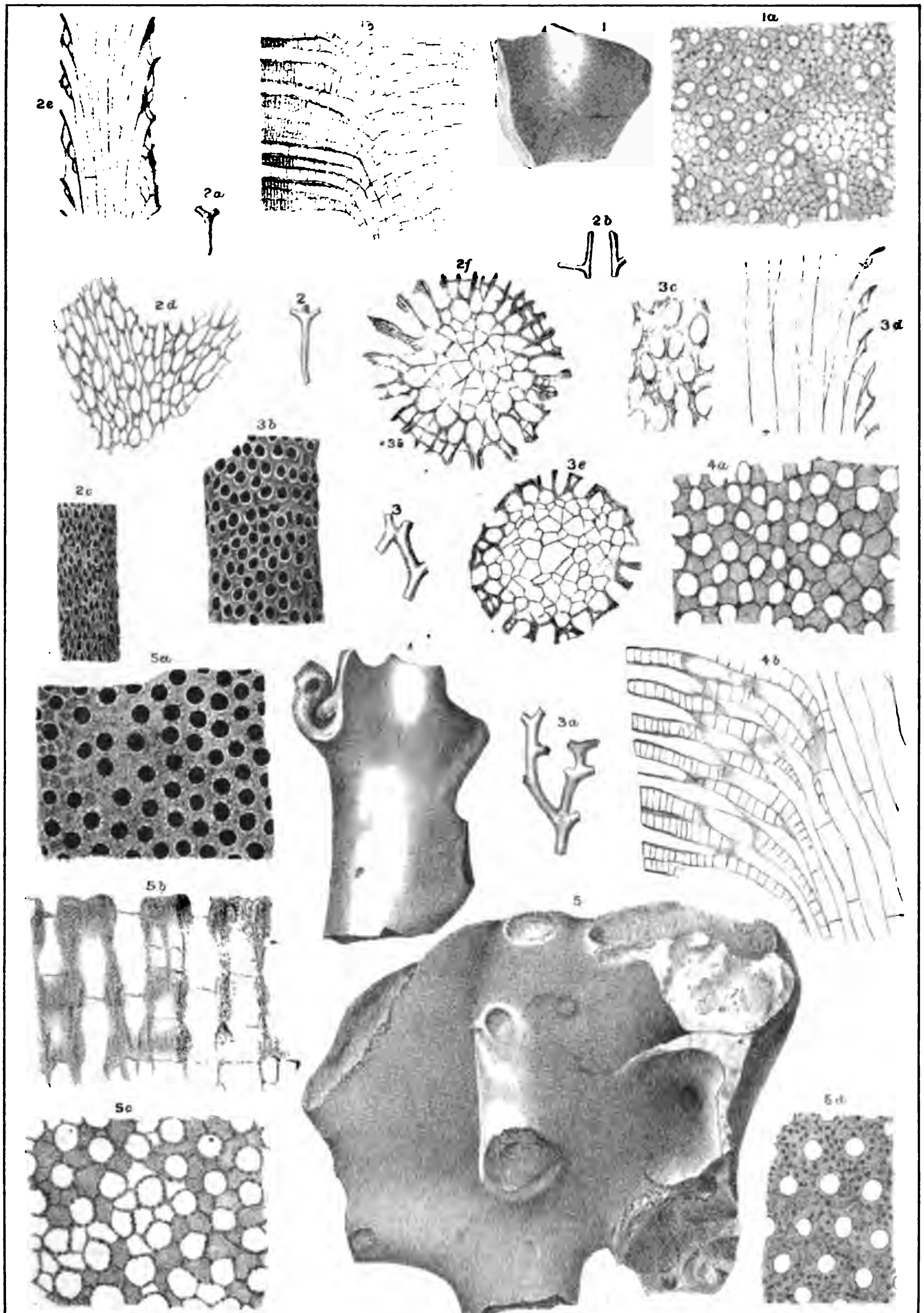

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PLATE XXXV.

PAGE.

Fig. 1. BATOSTOMELLA SIMULATRIX Ulr.. 432
1, 1 *a* and 1 *b*. Three fragments from Ohio localities. Natural size.
1 *c*. A slightly more slender example from Sterling, Ill.
1 *d*. Surface of 1 *a*, x12, shows its usual appearance.
1 *e*. A small portion of same, x28, showing the perfect condition of the zoœcia and mesopore apertures. Also one of the opercular covers.
1 *f*. Tangential section x18.
1 *g*. Vertical section x18.
Cincinnati group.
Illinois State Museum and E. O. Ulrich's collection.

Fig. 2. BATOSTOMELLA GRACILIS Nicholson.. 434
Tangential section of the best preserved example seen, x35.
Cincinnati, Ohio.

Fig. 3. BATOSTOMA IMPERFECTUM Ulr.. 460
3. An example of medium size. Natural size.
3 *a*. Surface of same, x12.
3 *b*. Tangential section, x18, showing the incomplete diaphragms.
3 *c*. A small portion of same, x35, to show the structure of the walls more clearly.
3 *d*. Outer portion of a vertical section, x18.
Cincinnati group.
Illinois State Museum and E. O. Ulrich's collection.

Figs. 4 and 5. BATOSTOMA VARIABILE Ulr. (See also Pl. XXXVI)........................ 460
4 and 4 *a*. Two fragments from Savannah, Ill.
4 *b*. A ramose example from Ohio.
4 *c* and 4 *d*. Two tangential sections, x18. The former represents the appearance just below the surface, the latter just after the tubes bend outward.
4 *e*. About half of a vertical section, x18.
5. A ramose example from Osgood, Ind.
5 *a*. This figure is incorrect.
Cincinnati group.
Illinois State Museum and E. O. Ulrich's collection.

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(Silurian Bryozoa.)

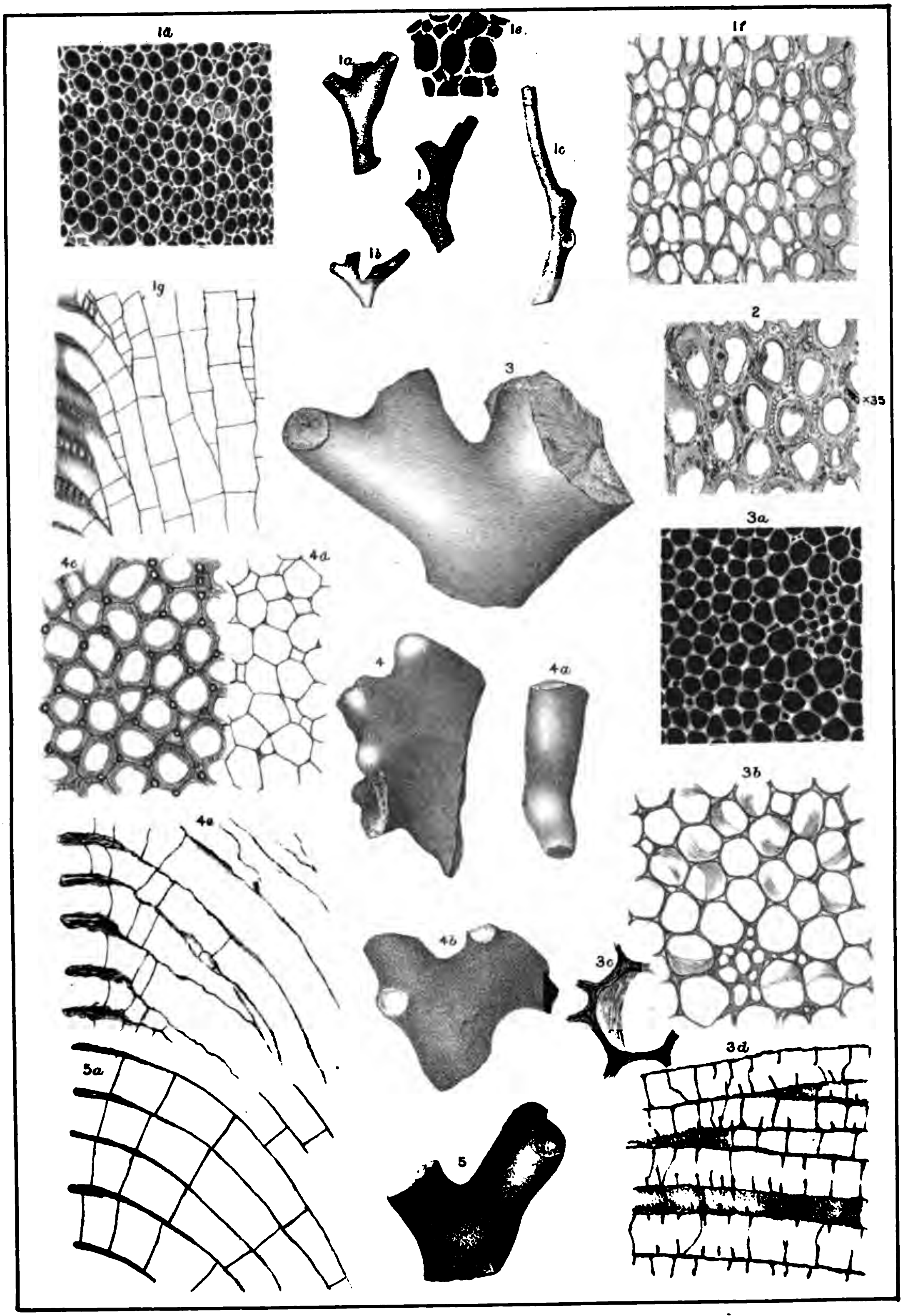

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PLATE XXXVI.

PAGE.

Fig. 1. **Batostoma variabile** Ulr 460
Surface of example represented, by figure 5, on pl. XXXV, x12. This specimen is remarkable in having exceedingly few mesopores.

Fig. 2. **Amplexopora affinis** Ulr 450
2. A fragment of this species. Natural size.
2 *a*. Tangential section of same, showing the thin walls and large acanthopores x18.
Cincinnati group, Wilmington, Ill.
Illinois State Museum, and E. O. Ulrich's collection.

Fig. 3. **Amplexopora pustulosa** Ulr 451
3. A subramose example. Natural size.
3 *a*. Surface of same x12.
3 *b*. Tangential section x18, showing the thin walls and small acanthopores.
3 *c*. Part of a vertical section x18.
Cincinnati group, Hanover, O.
E. O. Ulrich's collection.

Fig. 4. **Leptotrypa? stidhami** Ulr 456
4. A characteristic example of this species. Natural size.
4 *a*. Tangential section, showing the thin walls, unequal zoœcia and large acanthopores, x18.
4 *b*. Vertical section showing the regular tabulation, x18.
Cincinnati group, Brown Co., Ohio.
E. O. Ulrich's collection.

Fig. 5. **Leptotrypa semipilaris** Ulr 457
5. A discoidal example.
5 *a*. A smaller hemispheric specimen.
5 *b*. A sectional view of 5, all natural size.
5 *c*. Tangential section, x18.
5 *d*. Vertical section x18, showing the untabulated long tubes, and several acanthopores.
Cincinnati, Ohio.
E. O. Ulrich's collection.

Plate XXXVI—*Continued.*

PAGE.

Fig. 6. **Leptotrypa hexagonalis** Ulr 455

6. An example attached to a small *Orthoceras* or *Hyolithes*. Natural size.

6 *a*. Surface of same x12.

Trenton limestone, Calhoun Co., Ill.

Illinois State Museum, and E. O. Ulrich's collection.

Fig. 7. **Leptotrypa filiosa**? (d'Orbigny).. 456

7. Tangential section. showing small and infrequent acanthopores, x18.

7 *a*. Vertical sextion x18.

Trenton limestone, Calhoun Co., Ill.

Illinois State Museum.

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[Silurian Bryozoa.]

PL. XXXVI.

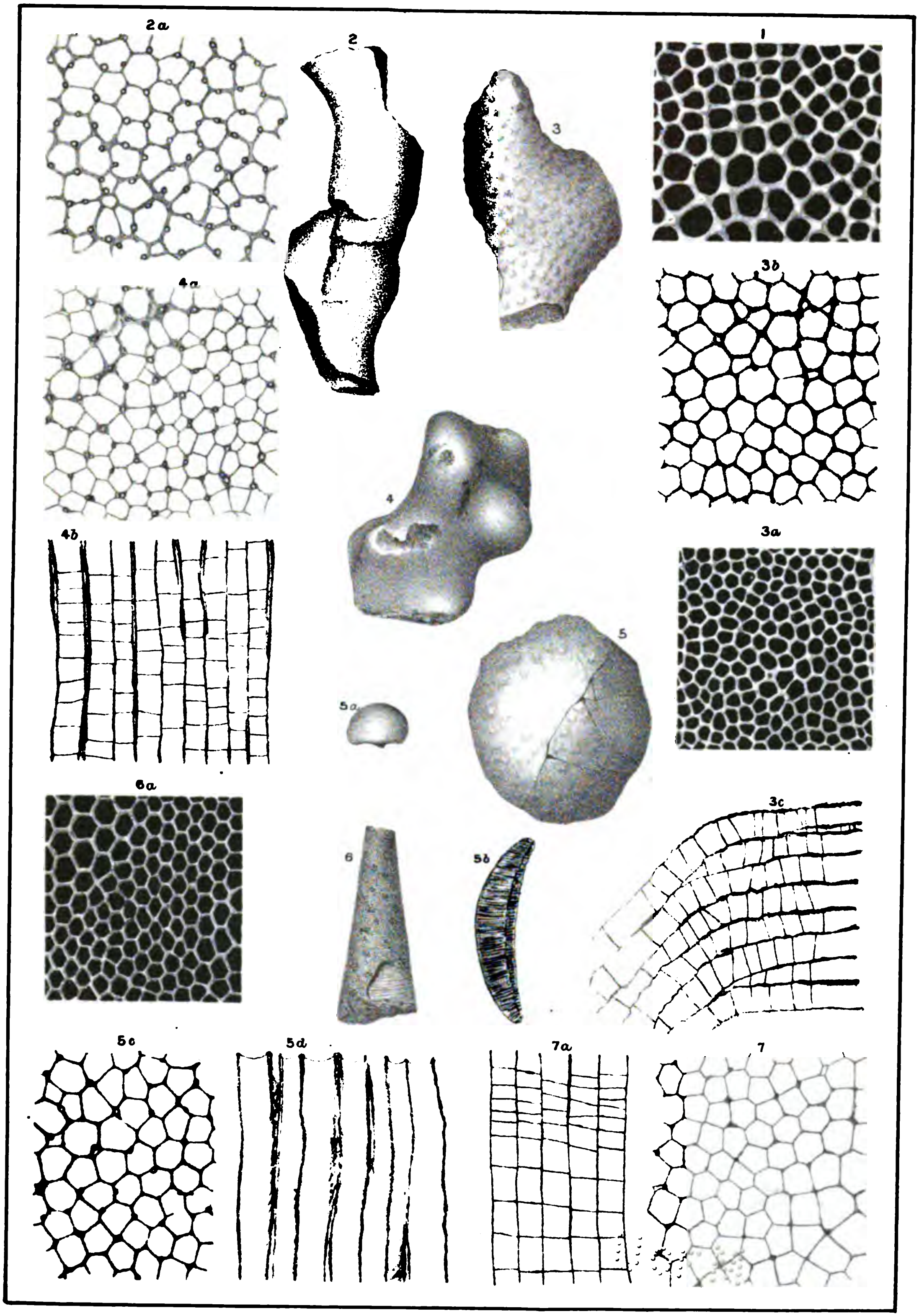

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PLATE XXXVII.

PAGE.

Fig. 1. HETEROTRYPA PROLIFICA Ulr.. 413

1. A nearly complete example of the frondescent form of this species. Natural size.
1 *a*. Surface of same x12.
2 *b*. Tangential section x18.
1 *c*. Portion of 1 *b* x50, to show the minute structure of walls and acanthopores.
1 *d*. Outer portion of a vertical sextion, x18. Near the left margin are shown some of the peculiar concave diaphragms.
Cincinnati group, Blanchester, Ohio.
E. O. Ulrich's collection.

Fig. 2. HETEROTRYPA INFLECTA Ulr.... 414

2 and 2 *a*. Two fragments of this species. Natural size.
2 *b*. Surface x12. Shows its perfect condition.
2 *c*. Vertical section x18, showing structure just beneath the surface of a perfect example.
Cincinnati, Ohio.
E. O. Ulrich's collection.

Fig. 3. HETEROTRYPA SINGULARIS Ulr.. 415

3. A fragment of medium size. 3 *a*, one much smaller. Both natural size.
3 *b*. Surface of the larger specimen x12. Slightly worn.
3 *c*. Tangential section x18.
3 *d*. Portion of 3c. x50.
3 *e*. Peripheral portion of a vertical section, x18, showing the irregular tabulation of the zoœcial tubes.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

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PL. XXXVII.

(Silurian Bryozoa.)

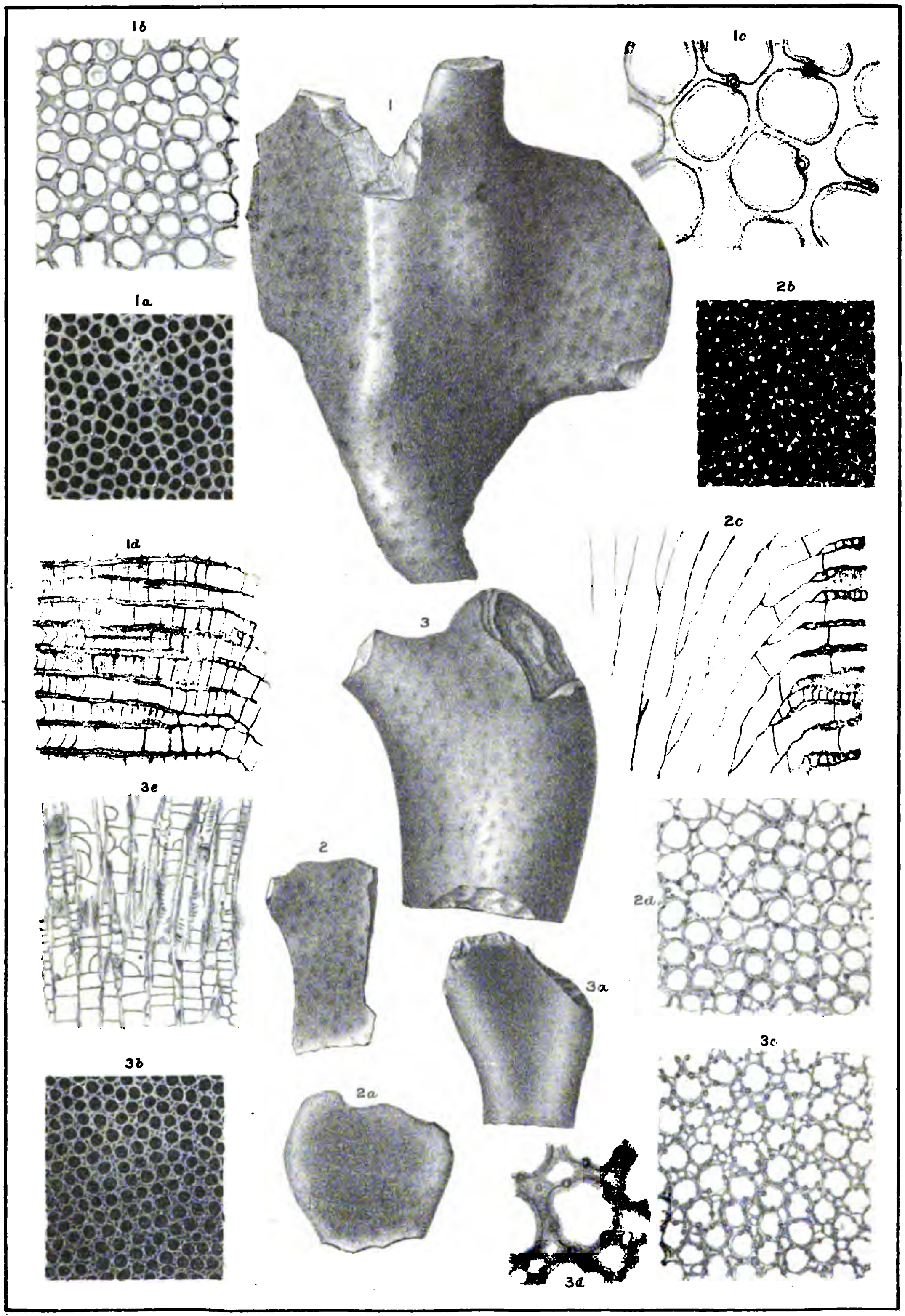

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PLATE XXXVIII.

PAGE.

Fig. 1. **TREMATOPORA CALLOPOROIDES** Ulr 420

1. Natural size view of the type specimen.
1 *a*. Surface of same, x12.
1 *b*. Tangential section, showing small acanthopores, x18.
1 *c* and 1 *d*. Two portions of a vertical section, x18.
Top of Trenton, Alexander Co., Ill.
Illinois State Museum.

Fig. 2. **MONOTRYPELLA CRASSIMURALIS** Ulr 452

2 and 2 *a*. Two examples of this species showing mode of branching and size of stems. The drawing of the cells on 2 *a*, is not natural.
2 *b*. Surface x12. In other examples the interspaces are not flattened, and the sloping areas meet.
2 *c*. Tangential section of an example in which the zoœcia are almost isolated, x18.
2 *d*. Tangential section of another specimen in which the zoœcia are mainly in contact x35.
2 *e*. Vertical section of same specimen that furnished 2 *c*, x18. It shows the strongly tabulated interspaces.
2 *f*. Portion of a transverse section, x18, showing rhomboidal form of zoœcia in the axial region.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 3. **HOMOTRYPA ARBUSCULA** Ulr 409

3. Part of a fine example of this species. Natural size.
3 *a*. Surface of one of the branches x12, showing the oblique apertures.
3 *b*. Tangential section, x18.
3 *c*. Vertical section, x18. This example was not sufficiently developed to show cystiphragms. Section since prepared prove that in fully matured examples there are two or three of those structures near the surface in each zoœcial tube.
Birdseye limestone, High Bridge, Ky.
E. O. Ulrich's collection.

Fig. 4. **MONOTRYPA RECTIMURALIS** Ulr 462

4. A sub-hemispheric example. Natural size.
4 *a*. Tangential section, x18, with a small portion at the upper right hand corner, x50.
4 *b*. Vertical section, x18, showing the remote diaphragms and thin straight walls.
Cincinnati group, Alexander Co., Ill.
Illinois State Museum.

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GEOLOGICAL SURVEY OF ILLINOIS.

PL. XXXVIII.

[Silurian Bryozoa.]

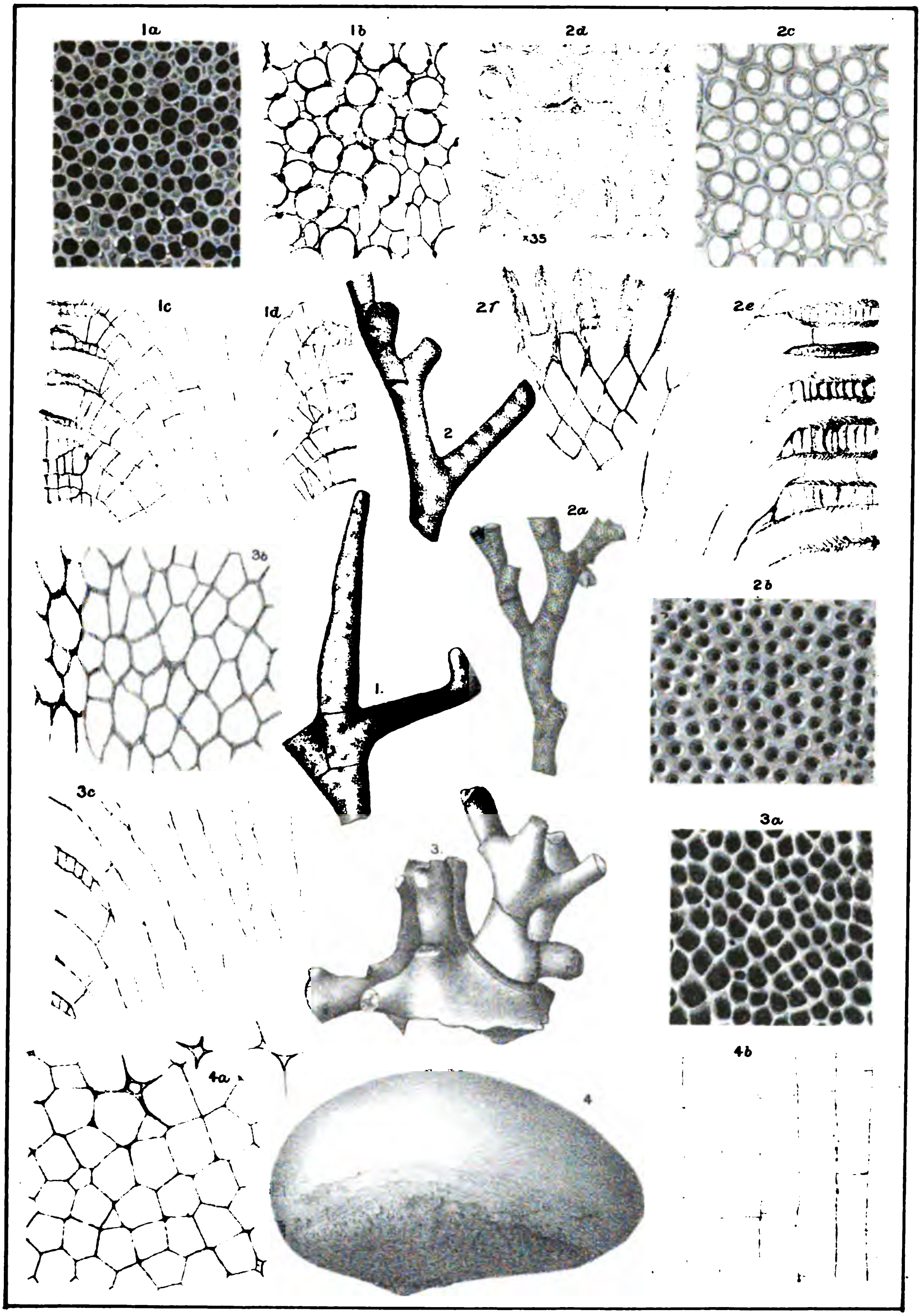

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PLATE XXXIX.*

PAGE

Fig. 1. CERAMOPORA IMBRICATA Hall 463

1. Tangential section showing irregular mesopores, faint lunarium. and peculiar wall structure, x18.

1 *a*. Portion of a vertical section, showing the cellulose basal layer, x18.

1 *b*. Tangential section to show the irregular structure of basal layer, x18.

Fig. 2. CERAMOPORELLA? OHIOENSIS (Nicholson) 466

2. Tangential section showing well marked lunarium, x18.

2 *a*. Vertical section, x 18, consisting of a complete layer, and a portion of another.

Fig. 3. DIAMESOPORA VAUPELI Ulr. (See also Pl. XLI.).. 468

3. Vertical section, x18. The two sides of the hollow stem have been brought close together

3 *b*. About one-fourth of a transverse section, showing thickness of the zoarium, x18.

Fig. 3 *a*. DIAMESOPORA COMMUNIS Ulr. (See also Pl. XLI.) 469

Tangential section showing irregular wall structure, mesopores, and lunaria, x18.

Fig. 4. CREPIPORA SIMULANS Ulr. (See also Pl. XL.) 470

4. Vertical section, passing through one of the maculæ, x18.

4 *a*. Tangential section showing a macula and the peculiar lunaria, x18.

Fig. 5. CHILOPORELLA FLABELLATA Ulr 381

5. Tangential section showing minute structure as in figures 2 and 3*a*, x18.

5 *a*. Vertical section showing the long tubular zoœcia, x 18.

5 *b*. Transverse section, x 18, showing the irregular, thin walled tubes of the axial region.

These figures are introduced to complete the generic illustrations of the CERAMOPORIDÆ, to which this plate is devoted. The species is rather common at the tops of the hills at Cincinnati, Ohio.

Fig. 6. CERAMOPORELLA DISTINCTA Ulr 464

6. Tangential section, x18, showing the characters of the genus.

6 *a*. Vertical section, x18, showing two complete layers growing in different directions.

Cincinnati, Ohio. E. O. Ulrich's collection.

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* The thin sections illustrated on this plate, the same as all the others figured on the plates of this volume, were prepared by E. O. Ulrich, and are now in his collection.

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GEOLOGICAL SURVEY OF ILLINOIS.

PL. XXXIX.

[Silurian Bryozoa.]

Ceramoporidae.

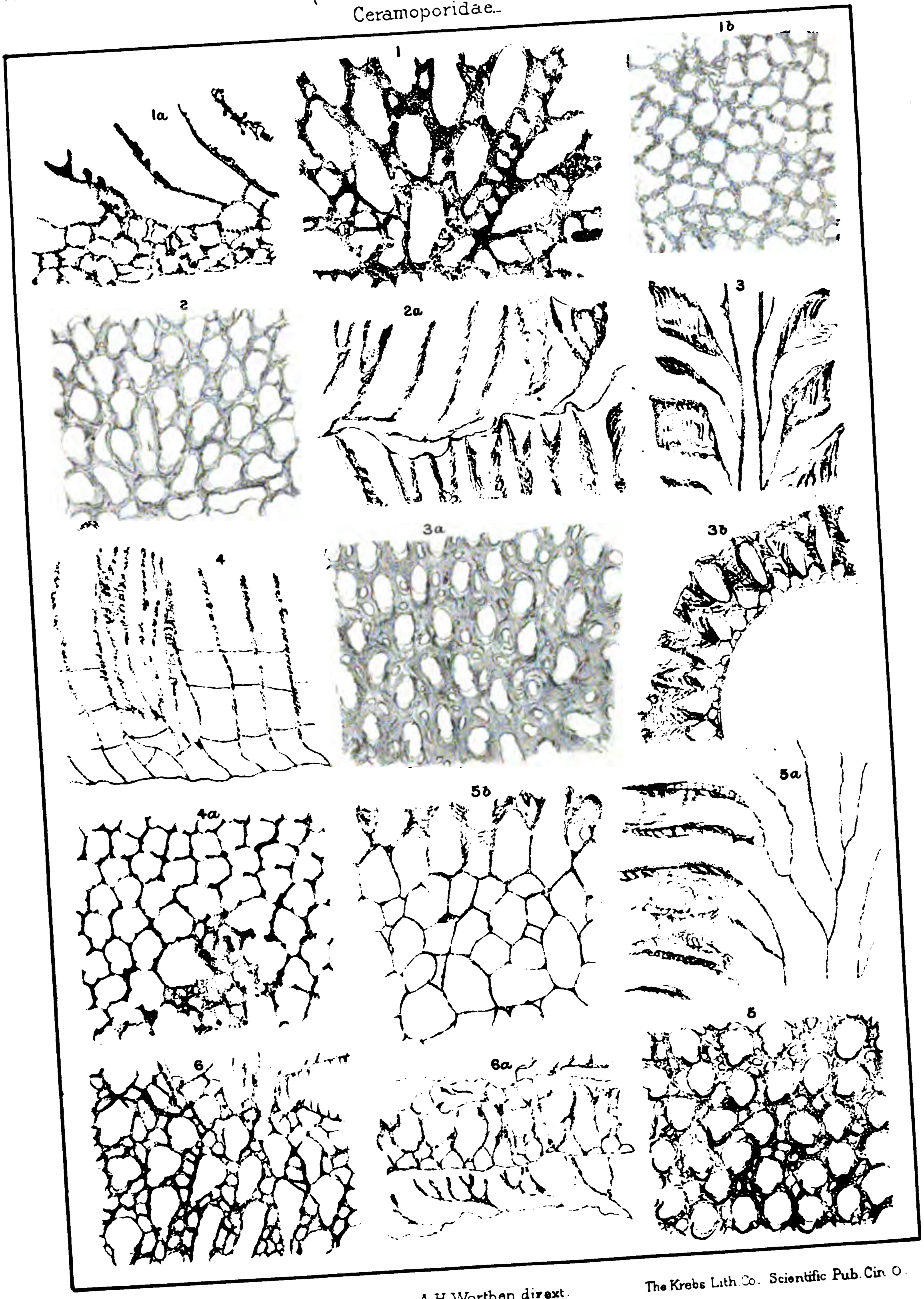

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PLATE XL.

PAGE

Fig. 1. CREPIPORA? EPIDERMATA Ulr 471

- 1. Under surface of an example of medium size.
- 1 *a.* Upper surface of a fragment showing arrangement of zoœcia and maculæ. Natural size.
- 1 *b.* Portion of 1*a*, x9, showing nearly direct apertures and slightly elevated lunarium.
- 1 *c.* Lower portion of a vertical section from the basal plate up, x18.
- 1 d. Upper portion of a vertical section, x18, showing the serrated walls.
- 1 *e.* Tangential section, x18, showing the usual form of the zoœcia and the radially lined lunaria.

  Cincinnati group, Wilmington, Ill,
  Illinois State Museum.

Fig. 2. CREPIPORA IMPRESSA Ulr 471

- 2. Natural size view of the type specimen. It is attached to a crinoid column or some other cylindrical body.
- 2 *a.* Surface of same, x12, showing the exceptionally developed lunaria and a portion af one of the large maculæ.

  Cincinnati group, Covington, Ky.
  E. O. Ulrich's collection.

Fig. 3. CREPIPORA SIMULANS Ulr. (See also Pl.XXXIX.) 470

- 3. Portion of a large encrusting example, showing distribution of the elevated maculæ and zoœcia. Natural size.
- 3 *a.* Surface of same, x12.

  Cincinnati group, Covington, Ky.
  E. O. Ulrich's collection.

Fig. 4. CREPIPORA SOLIDA Ulr 472

- 4. Portion of a large expansion on the shell of a Cephalopod. Natural size.
- 4 *a.* Surface of same x12, showing one of the solid maculæ.
- 4 *b.* Tangential section of same x18, showing the structure of one of the maculæ and the distinct lunaria.

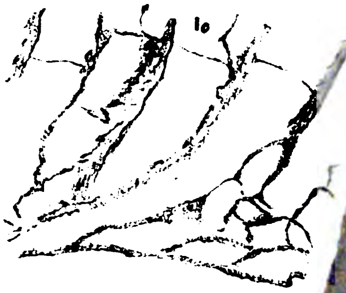
  Cincinnati group, Covington, Ky.
  E. O. Ulrich's collection.

Fig. 5. CREPIPORA HEMISPHÆRICA Ulr 472

- 5. Profile view of an example of the usual form. Natural size.
- 5 *a.* Tangential section x18, showing character of zoœcia and lunaria, and one of the small maculæ.
- 5 *b.* Portion of a vertical section x18, showing tabulation and irregular structure of the walls.

  Cincinnati group, Wilmington, Ill.
  Illinois State Museum.

(Silurian Bryozoa.)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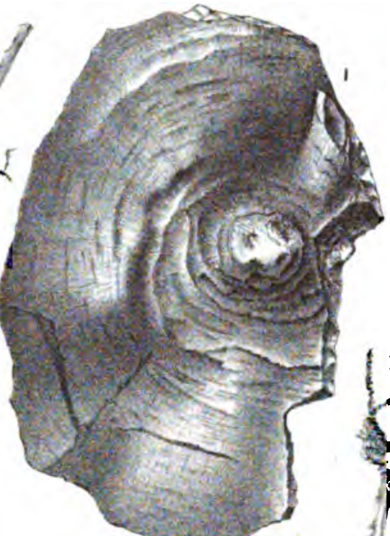
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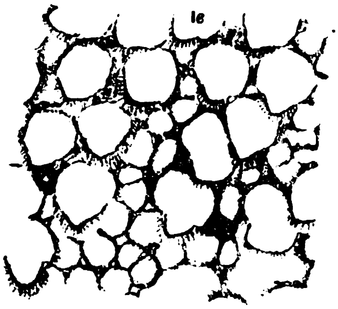
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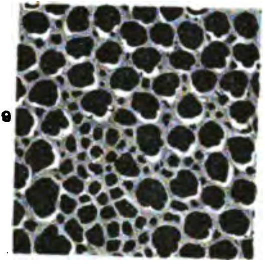
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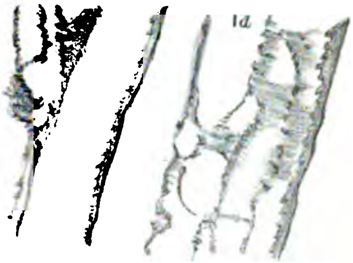
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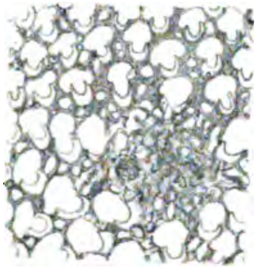
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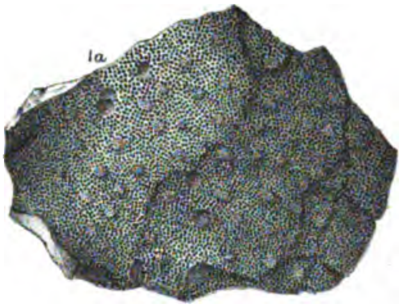
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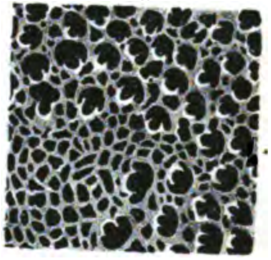
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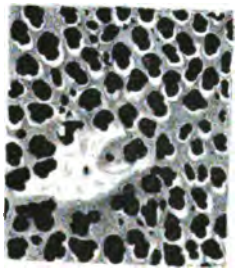
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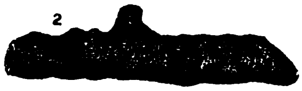
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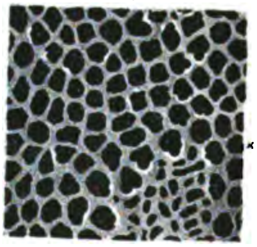
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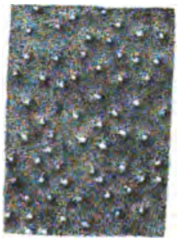
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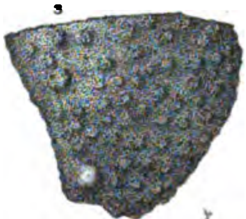
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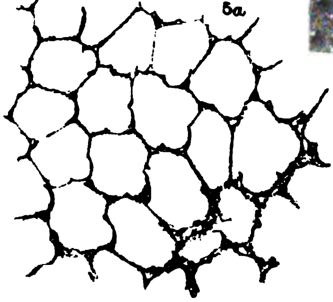
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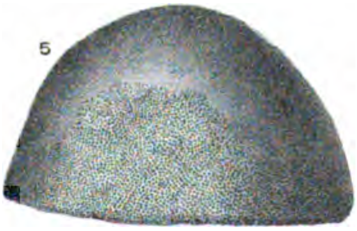
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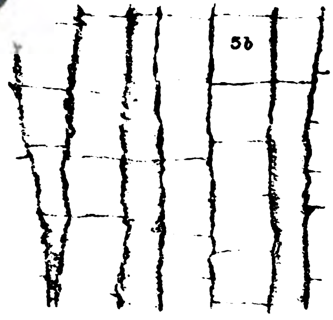
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PLATE XLI.

PAGE

Fig. 1. CERAMOPORELLA STELLATA Ulr. 465
1. Natural size, view of type specimen, showing the stellate maculæ.
1 *a*. Surface of same, x9.
Cincinnati group, Sterling, Ill.
Illinois State Museum.

Fig. 2. CERAMOPORELLA GRANULOSA Ulr.. 466
2. Vertical section, x 18, showing two layers of cells.
2 *a*. Tangential section, x18, showing the numerous acanthopore like granules and other peculiarities of the species.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 3. ANOLOTICHA PONDEROSA Ulr.. 473
3. An example of this species, natural size.
3 *a*. Surface of same, x9.
3 *b*. Tangential section showing the interrupted appearance of the lunaria, and distribution of zoœcia and mesopores, x18.
3 *c*. Small portion of a vertical section, x18, showing the principal characters of the species and genus.
3 *d*. The central part of a transverse section, x18.
Cincinnati group, Wilmington, Ill.
Illinois State Museum.

Fig. 4. DIAMESOPORA VAUPELI Ulr. (See also Pl. XXXIX.) 468
4. 4*a* and 4*b*. Three examples of this species, natural size.
4 *c*. Surface of 4, x9.
Cincinnati, Ohio.
E. O. Ulrich's collection.

Fig. 5. DIAMESOPORA COMMUNIS Ulr. (See also Pl. XXXIX.) 469
5 and 5 *a*. Two fragments of the ordinary size and appearance.
5 *b*. Surface x9, showing one of the maculæ, and the thick peristomes.
Cincinnati, Ohio.
E. O. Ulrich's collection.

(Silurian Bryozoa.)

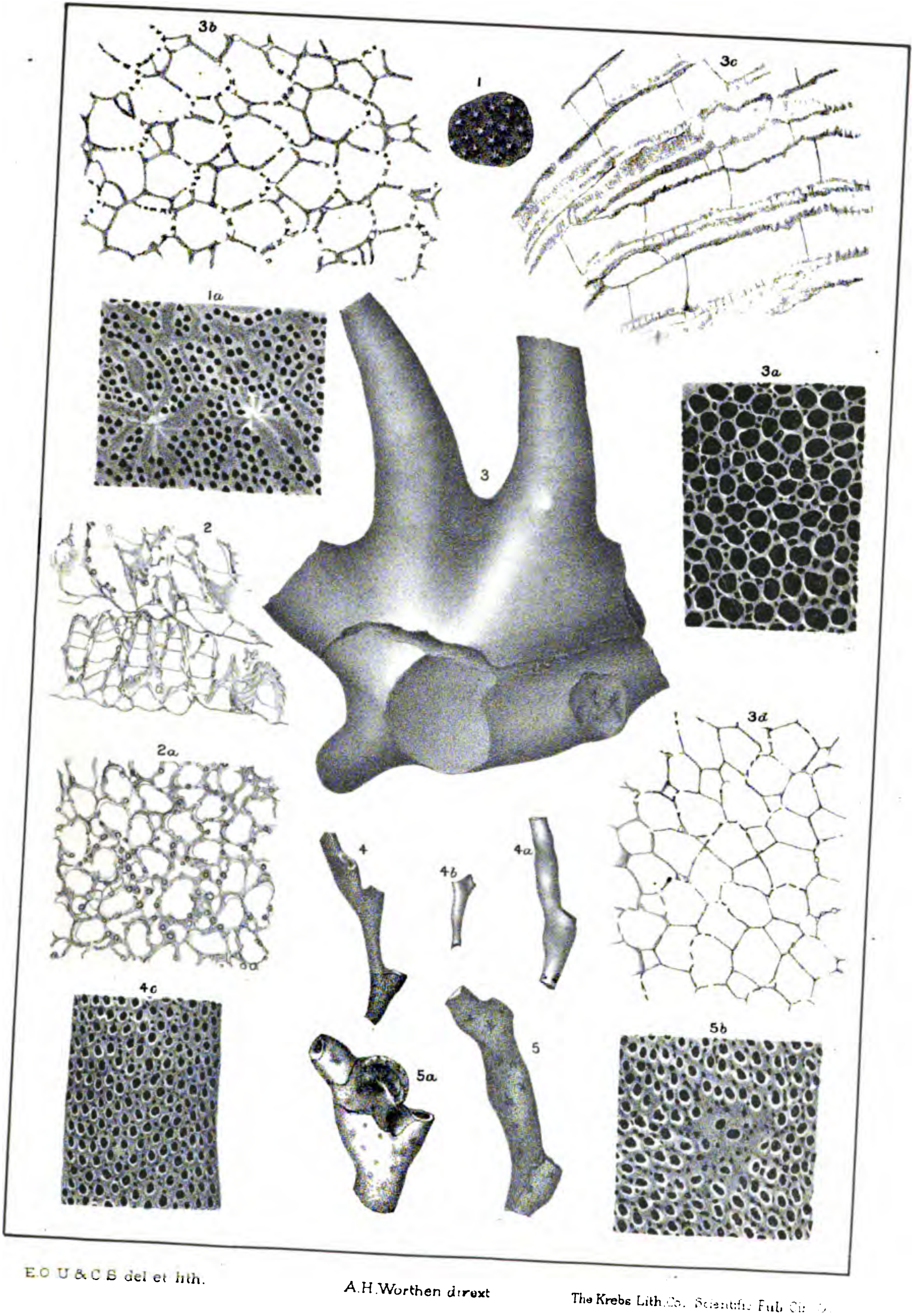

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PLATE XLII.

PAGE

Fig. 1. DICHOTRYPA GRANDIS Ulr 498
1. Portion of the type specimen, natural size.
1 *a*. Surface of same x9.
1 *b*. Portion of vertical section x18.
1 *c* and 1 *d* and 1 *e*. Three parts of a tangential section, x18, showing the structure at different levels.
Niagara group, Kankakee Co., Ill.
Illinois State Museum.

Fig. 2. DICHOTRYPA FOLIATA Ulr.. 499
2 and 2 *a*. Two fragments, natural size.
2 *b*. Surface x9, presenting the usual appearance.
2 *c*. Tangential section x 18, cutting the zoœcia just beneath their apertures.
2 *d*. Tangential section, x18, showing structure near the median laminæ.
2 *e*. Transverse section x18.
2 *f* and 2 *g*. Two vertical sections x18; the first shows well developed superior hemiseptum.
Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

Fig. 3. TÆNIOPORA OCCIDENTALIS Ulr.. 505
3. Fragment of this species, natural size.
3 *a*. Surface of same x9, showing linear arrangement of zoœcia.
3 *b*. Tangential section x18, showing one of the four faces, and, near the left margin, the sharply defined vertical lamina.
3 *c*. Transverse section x18, showing thickness of outer portion of zoarium.
Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

Fig. 3 *d*. TÆNIOPORA PENNIFORMIS Nicholson 505
Transverse section of this species introduced for comparison with fig. 3c.
Hamilton group, Eighteen Mile Creek, N. Y.

Fig. 4. CYSTODICTYA HAMILTONENSIS Ulr 493
A group of stems showing mode of branching, natural size,
Hamilton group, Buffalo. Iowa.
E. O. Ulrich's collection.

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[Up. Sil. & Dev. Bryozoa.]

PL. XLII.

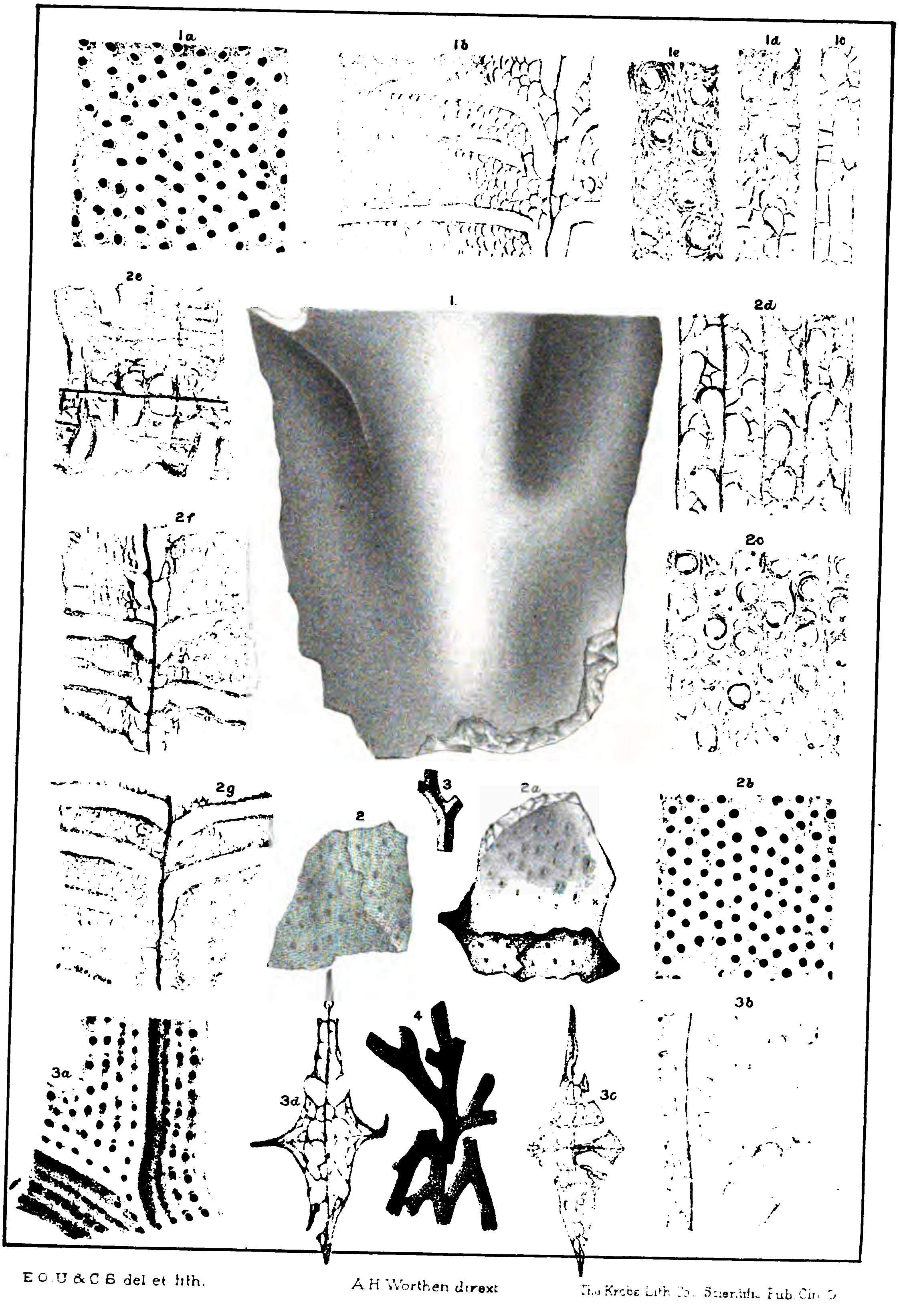

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PLATE XLIII.

PAGE

Fig. 1. CYSTODICTYA HAMILTONENSIS Ulr. (See also Pl. XLII.) 193
Surface x9.
Hamilton group, Buffalo, Iowa.

Fig. 2. SCALARIPORA SEPARATA Ulr 507
An example of this species showing the widely separated transverse carinæ. Natural size.
Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

Fig. 3. SCALARIPORA APPROXIMATA Ul... 508
An example of this species natural size. Like the preceding its surface is not well preserved.
Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

Fig. 4. EUSPILOPORA SERRATA Ulr 526
4. 4 *a*, 4 *b* and 4 *c*. Four nearly complete examples from Buffalo, Iowa.
E. O. Ulrich's collection.
4 *d*. Another specimen from Thunder Bay, Mich.
Prof. A. H. Worthen's collection.
4 *e*. Surface x18, showing arrangement of zoœcia and granulose interspaces.
4 *f*. Tangential section x 18.
4 *g*. Portion of 4 *f*, x50, to show more clearly the minute structure of the interspaces.
4 *h*. Vertical section x25.

Fig. 5. EUSPILOPORA? BARRISI Ulr.. 527
5. The largest specimen seen. Natural size.
5 *a*. Surface of same x9. It is somewhat abraded.
5 *b*. Vertical section, x18, showing the tubular oblique zoœcia and irregular median line.
5 *c*. Tangential section, x18.
5 *d*. Transverse section, x 18, showing the peculiar form of the primitive portion of the zoœcia and the irregularly flexuous mesial line.
Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

Fig. 6. INTRAPORA COSCINIFORMIS (Nicholson) 532
6. Tangential section x18, showing the thin zoœcia walls and the numerous mesopores.
6 *a*. A vertical section x18, showing form of zoœcia and the laminated structure of the interspaces.
Hamilton group, Arkona, Ontario.
E. O. Ulrich's collection.

Plate XLIII—*Continued.*

PAGE.

Fig. 7. CYSTODICTYA GILBERTI Meek 320
Two marginal rows of cells in perfect condition, x18.
Upper Helderberg, Falls of the Ohio.
E. O. Ulrich's collection.

Fig. 8. COSCINIUM CRIBRIFORME Prout 497
Marginal row of cells x 18, showing like the preceding the perfect condition of the superficial aperture among the *Cystodictyonidæ*.
Ohio Falls.

Fig. 9. BOTRYLLOPORA SOCIALIS (?) Nicholson 490
9. Portion of a large colony, natural size.
9 *a*. Tangential section of same, x18, showing four zoœcia rays separated by interstitial vesicles, and at the upper left hand corner several of the large vesicles filling the spaces between the stars of a colony.
9 *b*. Vertical section of same x18, showing part of two layers. The small tabulated tubes represent the zoœcia.
Hamilton group, Erie Co., N. Y.
E. O. Ulrich's collection.

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[Devonian Bryozoa.]

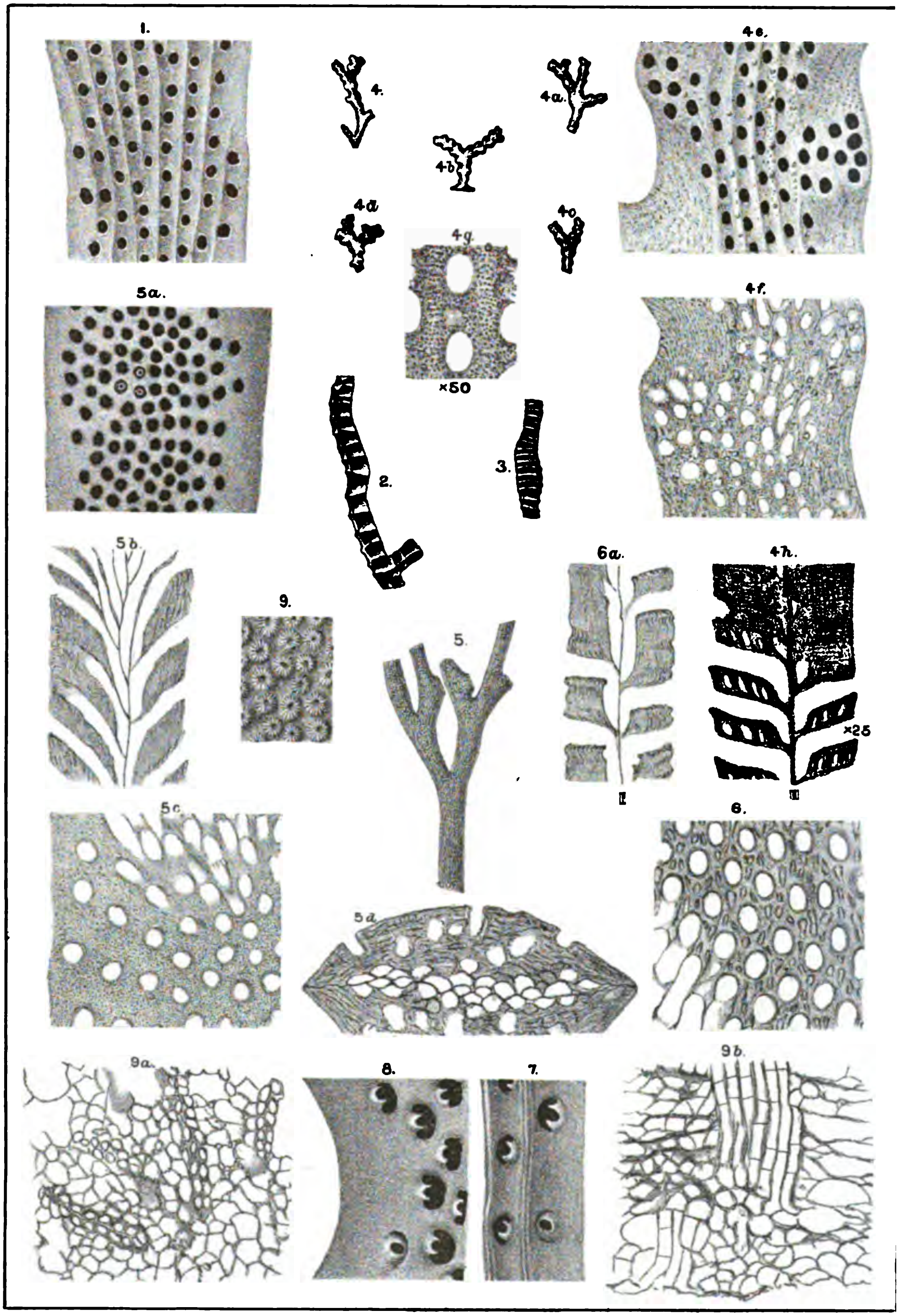

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PLATE XLIV.

PAGE

Fig. 1. **FENESTELLA VERA** Ulr. (See also Pl. LIV.) 535

1. Obverse x9.

1 *a*. Reverse x9. The portion selected has the branches a little closer than usual.

Hamilton group, Buffalo, Iowa.

E. O. Ulrich's collection.

Fig. 2. **FENESTRAPORA OCCIDENTALIS** Ulr. (See also Pl. LIV.) 558

2. An example showing the obverse side. Natural size.

2 *a*. Surface of same x9, showing the carinæ and large pores only, the branches being covered by the matrix.

Hamilton group, Buffalo, Iowa.

Prof. A. H. Worthen's collection.

Fig. 3. **SEMICOSCINIUM PLANODORSATUM** Ulr. 555

3. The obverse side of a finely preserved example. Natural size.

3 *a*. The upper or reverse face of same, x9.

3 *b*. Obverse, x9. The carina is wanting on portions of several branches.

Upper Helderberg, Ohio Falls.

E. O. Ulrich's collection.

Fig. 4. **SEMICOSCINIUM RHOMBICUM** Ulr. (See also Pl. LIV.) 556

4. Portion of the obverse surface x9, showing the flexuous branches, thin keel, and large cells on the dissepiments.

4 *a*. Portion of the reverse x9.

Hamilton group, Buffalo, Iowa.

E. O. Elrich's collection.

Fig. 5. **PHYLLOPORA ASPERA** Ulr 613

5. An example showing only the basal portion of the zoarium. Natural size.

5 *a*. The outer or obverse surface of same x9, showing comparative size of the inosculating branches and fenestrules, and the irregular elevated points.

5 *b*. The reverse of same x9.

Upper Helderberg, Ohio Falls.

E. O. Ulrich's collection.

Plate XLIV—*Continued.*

PAGE.

Fig. 6. **PHYLLOPORA SUPERBA** Ulr. (See also Pl. LV.) 613

6. A fragment showing the obverse face. Natural size.
6 *a*. A large specimen presenting the reverse side. Natural size.
6 *b*. Portion of fig. 6 enlarged 9x.
6 *c*. Portion of fig. 6 *a* enlarged 9x.
Hamilton group, Erie Co., N. Y.
E. O. Ulrich's collection.

Fig. 7. **HEMITRYPA TENERA** Ulr. (See also Pl. LIV.) 559

7. The superficial net work, x9.
7 *a*. The reverse aspect of the zoarium, x9.
Hamilton group, Davenport, Iowa.
E. O. Ulrich's collection.

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PL.XLIV

[Devonian Bryozoa.]

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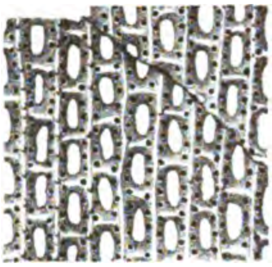

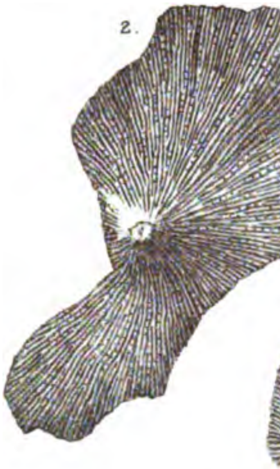

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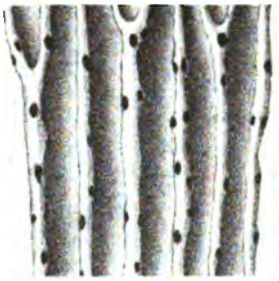

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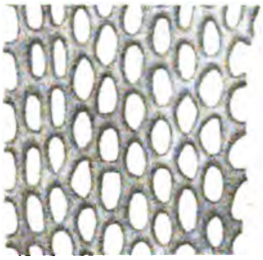

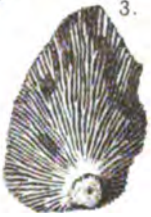

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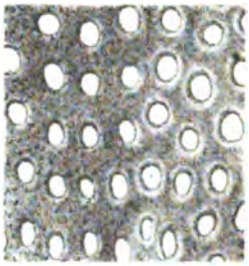

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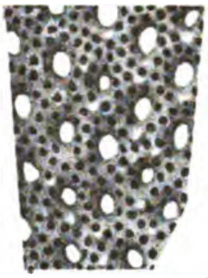

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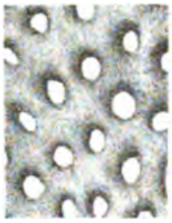

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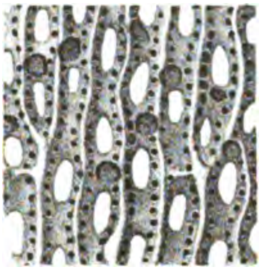

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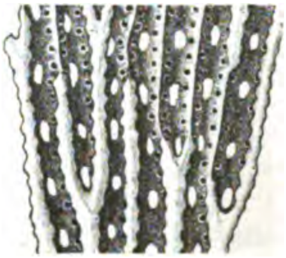

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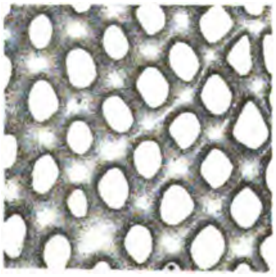

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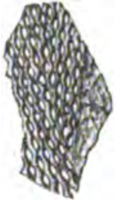

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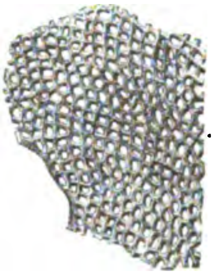

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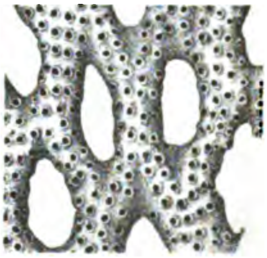

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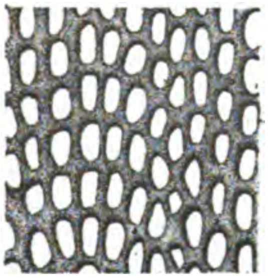

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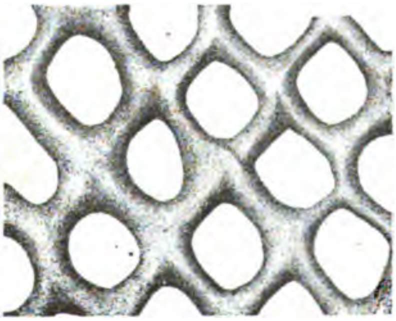

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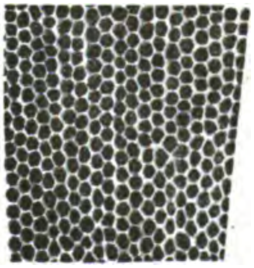

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PLATE XLV.

PAGE.

Fig. 1. **RHOMBOPORA SUBANNULATA** Ulr 648
- 1, 1 *a* and 1 *b*. Three specimens showing mode of branching and faint annulations. Natural size.
- 1 *c*. A somewhat worn specimen doubtfully referred to this species. Natural size.
- 1 *d*. Surface of fig. 1, x12, showing fully matured condition.
- 1 *e*. Tangential section of an old example, x25.
- 1 *f*. Surface of fig. 1 *a*, Showing appearance of young evamples, x12.
- 1 *g*. Tangential section deeper than 1 *e*, showing less mature stage, x25.
- 1 *h*. Vertical section, x25, showing superior hemisepta and flexuous walls.
- 1 *i*. Transverse section, x25. The transverse lines near the margin do not represent the diaphragms but hemisepta.

Hamilton group, Buffalo, Iowa.
Prof. A. H. Worthen and E. O. Ulrich's collections.

Fig. 2. **RHOMBOPORA SULCIFERA** Ulr 649
- 2. Fragment, of the natural size.
- 2 *a*. Surface of same, x12, showing the external features of the species.
- 2 *b*. Tangential section, x25, showing the thick interspaces and acanthopores.

Hamilton group, Davenport, Iowa.
E. O. Ulrich's collection.

Figs. 3 and 4. **RHOMBOPORA LINEINODIS** Ulr 649
- 3. Three specimens showing natural size and manner of growth.
- 3 *a*. Surface of right hand example, x12.
- 3 *b*. Portion of central example, x12.
- 4. Two examples of a more frequently branching variety of this species.
- 4 *a*. Surface of one near its base, x12. The specimen is either abraded or has the granules and apertures obscured by a deposit of calcareous material.

Up. Helderberg, Ohio Falls.
E. O. Ulrich's collection.

Fig. 5. **DEKAYIA DEVONICA** Ulr 416
- 5. A fragment of a solid branch, showing slight monticules and its irregular growth. Natural size.
  Up. Helderberg, Falls of the Ohio.
- 5 *a*. A branching hollow fragment, probably representing another species. The surface, however, closely resembles that of fig. 5.
  Hamilton group, Erie Co., N. Y.
  E. O. Ulrich's collection.

Plate XLV—*Continued.*

PAGE.

5 *b*. Surface of 5 *a*, x12, showing the irregular zoœcia and large acanthopores.

5 *c*. Vertical section of N. Y. form, x18. Shows the tubular zoœcia, strong acanthopores, and the epithecal lining of the interior of the branches.

5 *d*. Tangential section of N. Y. form, showing acanthopores and the gradual thickening of the walls toward the surface, x18.

Fig. 6. **MONTICULIPORA WINCHELLI** Ulr. 408

6. Tangential section, x18, showing one of the group of large cells, and the small passage left by the cystiphragms.

6 *a*. Vertical section, x18, showing the closely arranged cystiphragms. In most of the tubes they present the appearance of ordinary diaphragms.
Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

GEOLOGICAL SURVEY OF ILLINOIS.

[Devonian Bryozoa.]

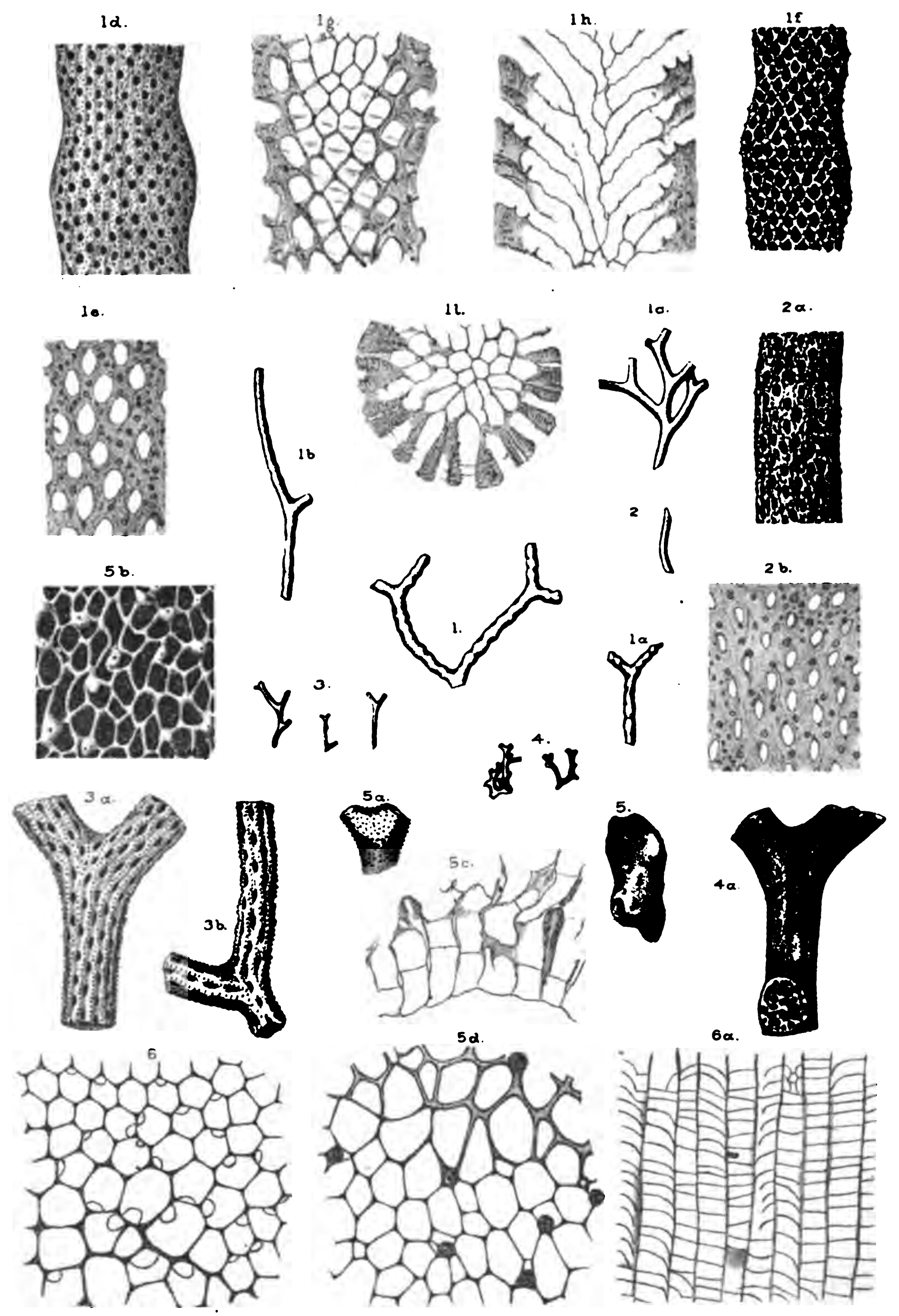

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PLATE XLVI.

PAGE.

Fig. 1. MONOTRYPELLA SIMPLEX Ulr. 454

1, 1*a* and 1 *b*. Three specimens showing natural size and mode of growth.

1 *c*. Surface x12, showing the thin walls and polygonal form of the zooecia and portions of two groups of large cells.

1 *d*. Tangential section, x18.

1 *e*. Vertical section, x18, showing tabulation of zooecial tubes.

Hamilton group, Rock Island, Ill.
E. O. Ulrich's collection.

Fig. 2. BATOSTOMELLA OBLIQUA Ulr. 433

2. Tuberculated example of this species, natural size.

2 *a*. Surface of same, x12, showing oblique zooecia apertures.

2 *b*. Tangential section, x18, showing peculiar granular structure of the walls and a few small acanthopores.

2 *c*. Vertical section, x18.

Hamilton group, Alpena, Mich.
E. O. Ulrich's collection.

Fig. 3. FISTULIPORA SPINULIFERA Rominger 480

3. A characteristic specimen of this species, showing the tuberculated surface. Natural size.

3 *a*. Surface of same, x12, showing one of the sub-solid tubercles, thin granulose walls and other features of the species.

3 *b*. Tangential section, x18.

3 *c*. Portion of 3 *b*, x35, showing several of the peculiar hollow granules.

3 *d*. Vertical section, x18, showing the gradual decrease in the size of the vesicles outward.

Hamilton group, Alpena, Mich.

Fig. 4. PETALOTRYPA COMPRESSA Ulr. 454

4, 4 *a* and 4 *b*. Three specimens, natural size, showing mode of growth.

4 *c*. Tangential section, x18, with numerous interstitial cells.

4 *d*. Tangential section, x18, with very few interstitial cells.

4 *e*. Portion of 4 *d*, x35, showing structure of walls.

4 *f*. Vertical section, x18, complete only on the left side of the zigzag mesial line.

Hamilton group, Davenport, Iowa, and Rock Island, Ill.
E. O. Ulrich's collection.

Fig. 5. PETALOTRYPA DELICATA Ulr. 454

5. Tangential section, x18, showing the sub-rhomboidal zooecia and their thin walls.

5 *a*. Vertical section, x18, showing the entire thickness of the zoarium, the short zooecia and strongly flexuous mesial line.

5 *b*. Portion of fig. 5, x35, showing the structure of the walls more clearly.

Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

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PLATE XLVII.

PAGE.

Fig 1. FISTULIPORA COMMUNIS Ulr. (See also Pl. XLVIII)............................ 476

1. Portion of specimen showing its natural size and the direction of its monticules. Many specimens are without these elevations.

1 *a*. Surface of same, x12, showing slightly abraded condition.
Hamilton group, Buffalo, Iowa.
Prof. A. H. Worthen's collection.

Fig. 2. FISTULIPORA STELLIFERA Rominger.. 481

2. An example natural size, showing distribution of stellate maculæ.

2 *a*. Surface of same, x12, showing arrangement of zoœcia around the maculæ.
Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

Fig. 3. FISTULIPORA MONTICULATA Ulr. (See also Pl. XLVIII)........................ 477

3. A tuberculated example showing mode of growth. Natural size.
Prof. A. H. Worthen's collection.

a. Smaller fragment without monticules. Natural size.
E. O. Ulrich's collection.

b. Surface of fig. 3, x12, showing usual characters.
Hamilton group, Buffalo, Iowa.

Fig. 4. STROTOPORA PERMINUTA Ulr.. 487

4 and 4 *a*. Two examples, one of them slightly tuberculated. Natural size.

4 *b*. Surface of fig. 4, x12, showing arrangement of zoœcia and oœcia.
Up. Helderberg, Ohio Falls.
E. O. Ulrich's collection.

Fig. 5. FISTULIPORA ASTRICA Ulr. (See also Pl. XLVIII)............................... 477

5. Fragment of this species; natural size.

5 *b*. Surface of same, x12.
Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

Fig. 6. FISTULIPORA COLLINA Ulr. (See also Pl. XLVIII)................................ 478

6. About half of a subcircular expansion; natural size.

a. Surface of same, x12, showing the thin interspaces and faintly elevated lunarium.
Hamilton group, Buffalo, Iowa.
E. O. Ulrich's collection.

Plate XLVII—*Continued.*

PAGE.

Fig. 7. **FISTULIPORA FOORDI**, Ulr. (See also Pl. XLVIII)................................ 479

7. A specimen showing distribution of maculæ and zoœcia.

7 *a*. Surface of same, x9, showing the opercular covers closing many of the triangular zoœcia apertures.
Hamilton group, Rockford, Iowa.
E. O. Ulrich's collection.

Fig. 8. **FISTULIPORA CORRUGATA** Ulr.. 480

8. Portion of a large expansion showing the strongly wrinkled under surface, and at the bottom a small fragment showing the celluliferous aspect.

8 *a*. Celluliferous surface, x12, showing one of the maculæ and the arrangement of the zoœcia aperture.
Hamilton group, Thunder Bay, Mich.
Prof. A. H. Worthen's collection.

VOL. VIII **GEOLOGICAL SURVEY OF ILLINOIS.** PL. XLVII

[Devonian Bryozoa.]

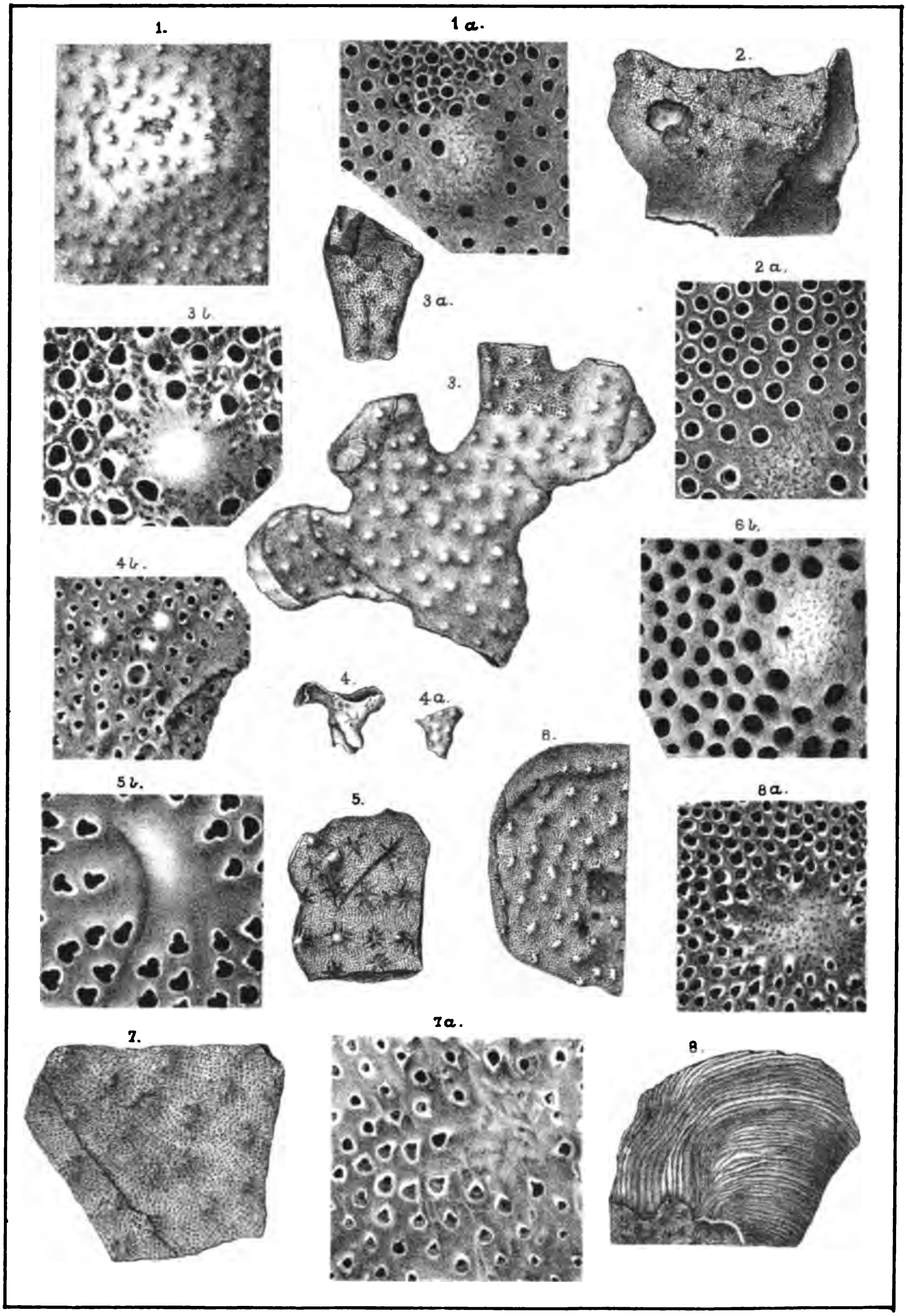

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PLATE XLVIII.

PAGE.

Fig. 1. FISTULIPORA COMMUNIS Ulr. (See also Pl. XLVII)................................ 476
  1. Vertical section, x18.
  1. *a*. Tangential section, x18, showing circular form of zooecia the absence of lunaria; and what appear to be minute perforations in the walls of the interstitial vesicles.

Fig. 2. FISTULIPORA MONTICULATA Ulr. (See also Pl. XLVII) 477
  2. Tangential section, x18, showing slight development of lunaria, and relative size of zooecia and mesopores.
  2 *a*. Vertical section, x18.

Fig. 3. FISTULIPORA ASTRICA Ulr. (See also Pl. XLVII)................................ 477
  3. Tangential section, x18, showing strongly developed lunaria and other features of the species.

Fig. 4. FISTULIPORA FOORDI Ulr. (See also Pl. XLVII)................................ 479
  4. Portion of vertical section from the surface down, x18.
  4 *a*. Tangential section, x18, showing form and relative size of zooecia and mesopores and the conspicuous lunaria.

Fig. 5. FISTULIPORA COLLINA Ulr. (See also Pl. XLVII).... 478
  5. Tangential section, x18. The lower left hand, portion of the figure represents a macula. To the right the zooecia are separated by gradually decreasing interspaces.
  5 *a*. Vertical section, x18, showing the thin and lightly flexuous walls and several diaphragms which appear to be minutely perforated.

Fig. 6. FISTULIPORA? CORRUGATA Ulr. (See also Pl. XLVII) 480
  6. Tangential section, x18, showing the structure of the zoarium just beneath the surface, where the interspaces between the zooecia are almost entirely filled with solid tissue.
  6 *a*. Tangential section, x18, showing the structure just above the basal lamina. Here the zooecia are arranged in longitudinal series between vertical plates, precisely as in *Dichotrypa*.
  6 *b*. Vertical section, x18, showing the full length of the zooecial tubes, the interspaces filled with solid tissue above, moderately developed superior hemisepta, and the wavy basal plate.

Plate XLVIII—*Continued.*

PAGE.

Fig. 7. BUSKOPORA LUNATA (Rominger) 489

7. A lamellate example with slightly elevated maculæ over about half of the surface. Natural size.

7 *a.* Surface of same, x9.

7 *b.* Portion of 7 *a*, x18, to show more clearly the character of the peristomes, lunaria and interspaces.

7 *c.* Another portion of the surface showing many of the cells partially closed by a membrane, x9.

7 *d.* View of the broken edge, x18. Shows the vesicular interstitial tissue, and several zoœcial tubes with the grooved internal ridges.

Upper Helderberg, Ohio Falls.

E. O. Ulrich's collection.

[Devonian Bryozoa.]

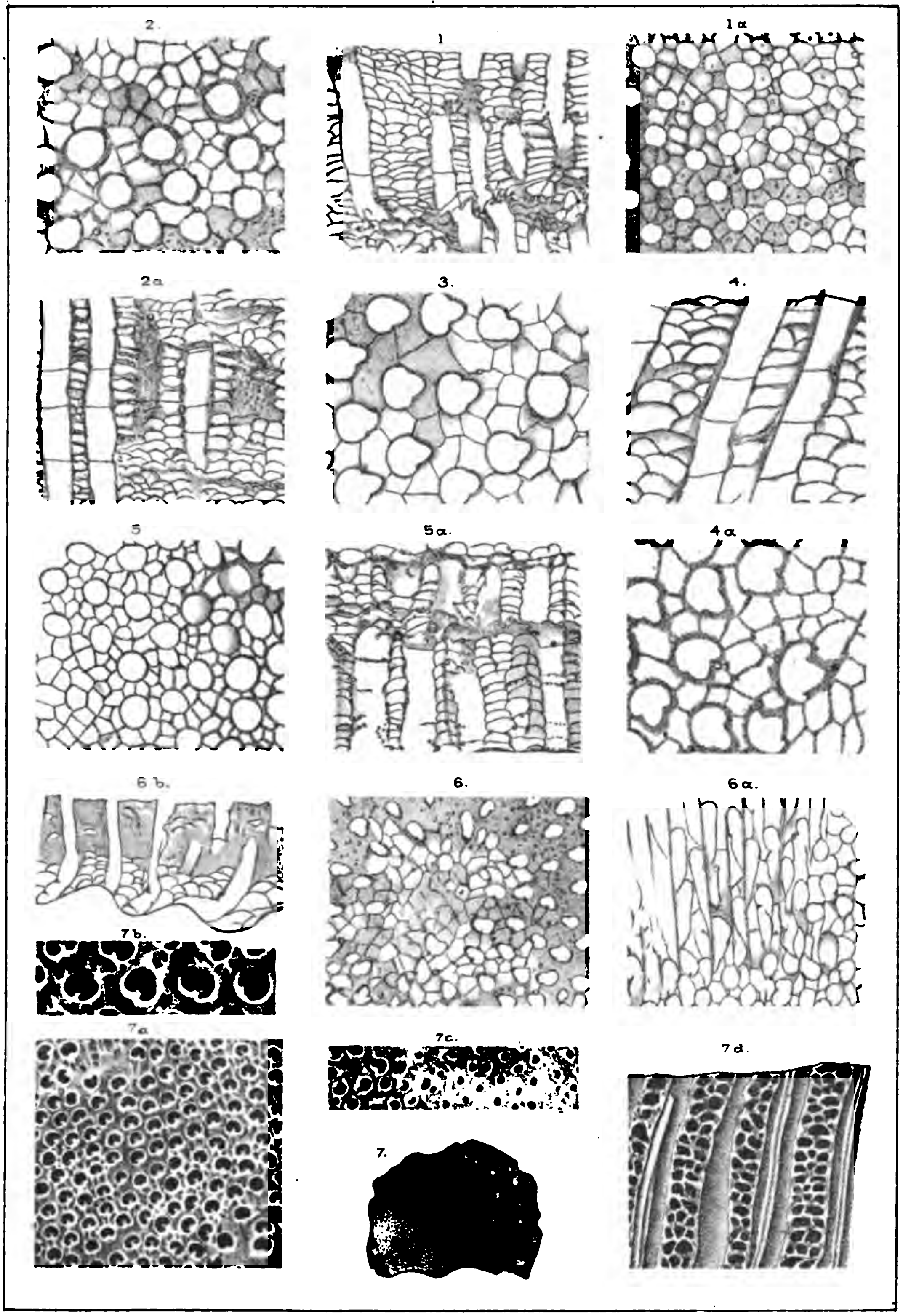

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PLATE XLIX.

PAGE.

Fig. 1. **Fenestella burlingtonensis** Ulr. ..:.. 536

1. Obverse face of a frond showing the usual characters of the species, x9.

1 *a*. Obverse side of another specimen having thinner branches and more elongate fenestrules, x9.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.

Fig. 2. **Fenestella filistriata** Ulr....... 535

2. Several branches showing the fine striæ and distribution of the zoœcia apertures, x9.

2 *a*. The reverse face of a "frond" showing the relative size of the branches and fenestrules, x9. Nearer the base the branches are comparatively a little stronger.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.

Fig. 3. **Fenestella rudis** Ulr.. 537

3. Obverse face of a frond, x9, showing the characters of the branches and other features of the species near the base.
Bentonsport, Iowa. Keokuk group.
Illinois State Museum.

3 *a*. Reverse aspect of another specimen showing the subnodose character of the branches, x9.

3 *b*. Obverse side of a fine specimen showing the appearance of the frond toward the upper margin. Also several of the supposed oœcia, x9.
Keokuk group. Warsaw, Ill.
Illinois State Museum.

3 *c*. Portion of fig. 3 *b*, x18, to show the fine striations, compressed tubercles, and the opercular covers.

3 *d*. A small portion of the reverse of a well preserved example, showing irregular nodes.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.

Fig. 4. **Fenestella limitaris**, Ulr......... 538

4. Obverse face, x9, showing the relative size of the branches and fenestrules, the obsolete carina, and the rather large and regularly alternating zoœcia apertures.

4 *a*. Reverse of same specimen. but from another portion where the branches are more rigid, x9.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

VOL. VIII. GEOLOGICAL SURVEY OF ILLINOIS. PL. XLIX.

(Low. Carb. Bryozoa.)

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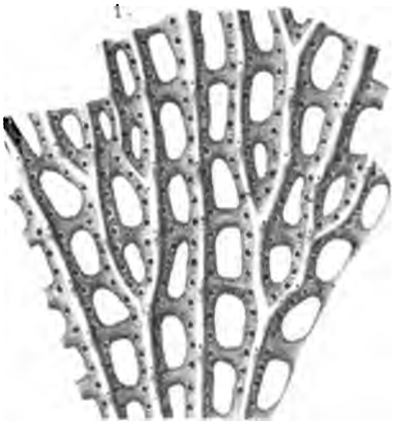

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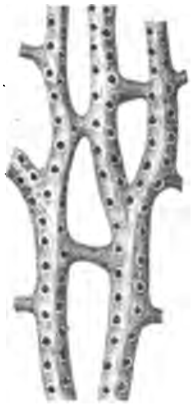

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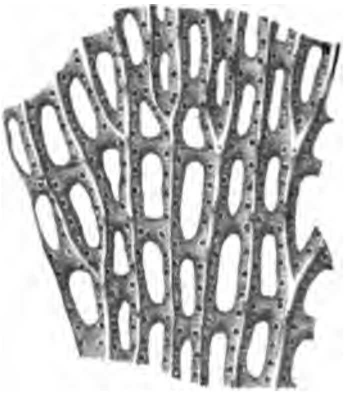

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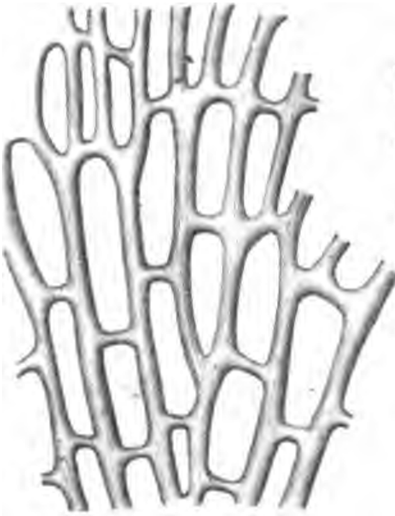

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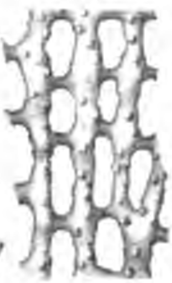

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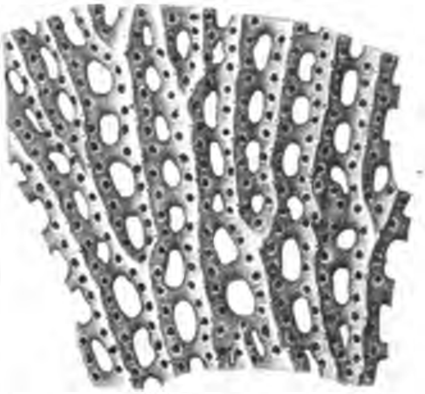

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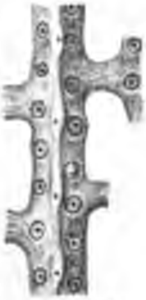

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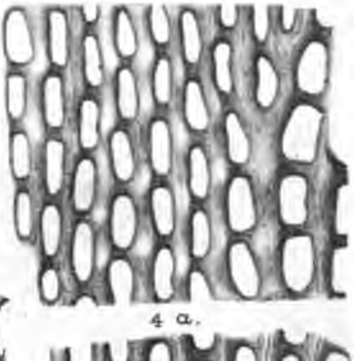

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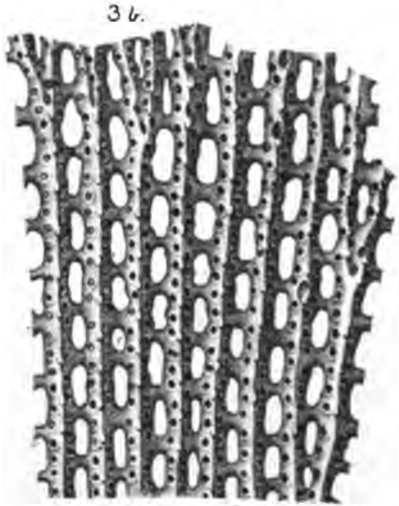

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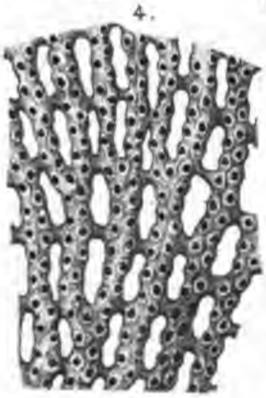

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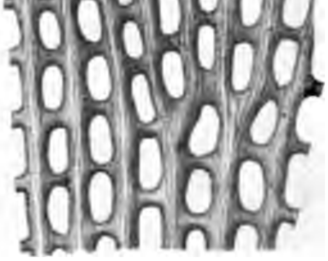

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PLATE L.

PAGE.

Fig. 1. FENESTELLA REGALIS Ulr. (See also Pl. LIV) 538

1. Portion of the obverse face of a nearly complete frond, x9, showing relative size of branches, dissepiments, and fenestrules, and the strong carina.

1 *a*. Reverse aspect of a frond, x9.
Keokuk group, Kings Mountain, Ky.
E. O. Ulrich's collection.

Fig. 2. FENESTELLA COMPRESSA var. NODODORSALIS Ulr. 540

Portion of the reverse face of a large frond, x9, showing the strong irregular nodes and the relative size of the branches, dissepiments and fenestrules.
Keokuk group, Kings Mountain, Ky.
E. O. Ulrich's collection.

Fig. 2 *a*. FENESTELLA COMPRESSA Ulr. 539

The obverse side of a very perfect example, x9, showing the narrow branches, prominent carina with its row of tubercles, and the angular dissepiments.
Keokuk group, Kings Mountain, Ky.
E. O. Ulrich's collection.

Fig. 3. FENESTELLA MULTISPINOSA Ulr. 540

3. The obverse face of the basal portion of a frond, x9.
Keokuk, Iowa. E. O. Ulrich's collection.

3 *a*. The reverse side of same, x9, showing rounded fenestrules and the numerous granules on both the branches and dissepiments. Farther out on the fronds the dissepiments are thinner, the fenestrules more nearly subquadrate and the branches appear straighter.

3 *b*. Thin section, x18, showing structure of the dense substance on the reverse.

3 *c*. Obverse face of a frond showing the appearance near the free margin, x9.

3 *d*. Thin section of a specimen with slightly larger fenestrules than usual, x18. Shows the minute structure at different levels.
Keokuk group, Kings Mountain, Ky.
E. O. Ulrich's collection.

Plate L—*Continued.*

PAGE.

Fig. 4. **FENESTELLA TRISERIALIS** Ulr....... 541

4. Obverse face of an example in a fairly good state of preservation, x9. The long tubular spines which are now known to have been present between the aperturas of each range, were broken away in freeing the specimen from the shaly matrix.

4 *a*. Thin section showing structure of frond at different levels, x18. At the lower left hand corner the black spot represent the bases of the tubular spines.

Fig. 5. **FENESTELLA SERRATULA** Ulr... 544

5. Obverse face of a perfect fragment, x9.

5 *a*. Portion of fig. 5, x18, showing as usual three cell apertures to the fenestrule.

5 *b*. Reverse aspect of same specimen, x9. In other examples the dissepiments are somewhat stronger and the fenestrules a little wider.

5 *c*. Profile view of a branch to show the serrate appearance of the carina.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

Low Carb Bryozoa

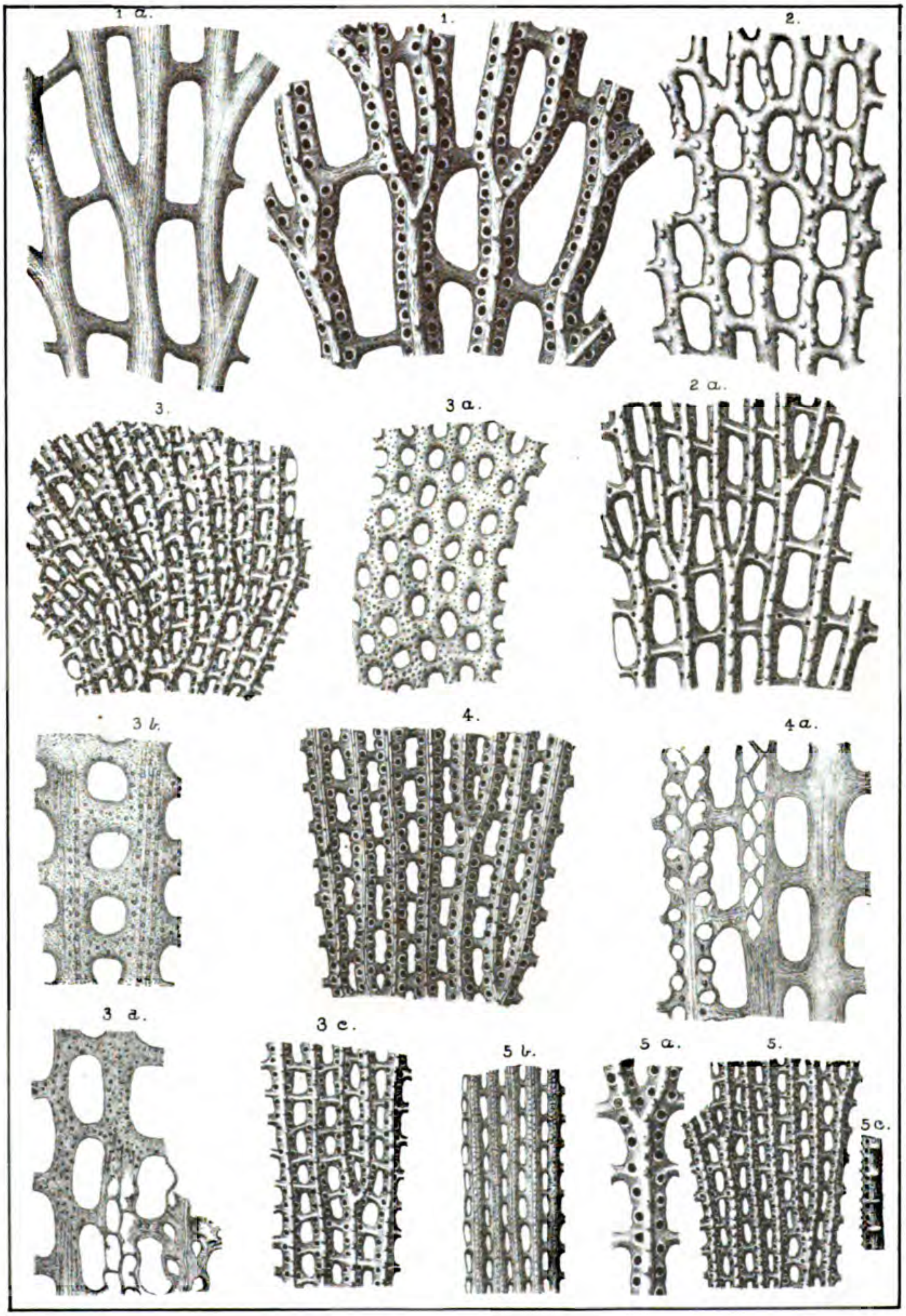

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PLATE LI.

PAGE

Fig. 1. **FENESTELLA EXIGUA** Ulr 545
- 1. Obverse face of the best specimen seen, showing the narrow and slightly flexuous branches, x9.
- 1 *a*. Reverse face of same, x9. The tubercles are not as strong as usual.

  Warsaw beds, Monroe Co., Ill.
  Illinois State Museum.

Fig. 2. **FENESTELLA TENAX** Ulr 546
- 2. Obverse face, x9, showing the usual appearance of the Warsaw beds form.
- 2 *a*. Portion of same. x18.
- 2 *b*. Reverse aspect of another fragment, x9.

  Monroe Co., Ill.
  Illinois State Museum.
- 2 *c*. Several branches of a specimen of the Chester group form, x18. This agrees with the Warsaw beds specimen.
- 2 *d*. A branch and two rows of fenestrules, x18, showing their usual form and relative size.
- 2 *e*. The reverse side of a branch of a variety with larger fenestrules and only 24 or 25 cells in 5 mm., x18.

  Chester group, Sloan's Valley, Ky.
  E. O. Ulrich's collection.

Fig. 3. **FENESTELLA ELEVATIPORA** Ulr 549
- 3. Obverse side of a fragment, x18. As seen lying on the surface of slabs the nearly flat branches appear almost to be in contact.
- 3 *a*. Reverse side of another fragment showing the strong rounded striations, x18.

  Chester group, Kaskaskia, Ill.
  Illinois State Museum.

Fig. 4. **FENESTELLA FLEXUOSA** Ulr 548
- 4. Obverse face of a fragment, x9, showing strongly flexuous branches. The tubercles on the keel are not shown strong enough.
- 4 *a*. Reverse side of another specimen, x9, showing the usual appearance of this side.
- 4 *b*. Several branches of a very perfect fragment, with the branches somewhat more rigid than in fig. 4, x9.
- 4 *c*. End view of several branches showing their form and the elevations of the tubercles, x9.

  Chester group, Sloan's Valley, Ky.
  E. O. Ulrich's collection.

Plate LI—*Continued.*

PAGE.

Fig. 5. **FENESTELLA CESTRIENSIS** Ulr.. 547

5. **Reverse side of a frond showing narrowly rounded branches and irregularly distributed nodes, x9.**
   Chester group, Sloan's Valley, Ky.
   E. O. Ulrich's collection.

5 *a*. **Thin section, x18, showing form of zoœcia at different levels.**

5 *b*. **Obverse face, x9, showing the relative size of branches and fenestrules, the thin carinæ, and the small nodes on same.**
   Chester group, Kaskaskia, Ill.
   Illinois State Museum.

Fig. 6. **FENESTELLA FUNICULA** Ulr.. 542

6. **Obverse side of a specimen, x9, showing the lax growth, cord-like carina and the peculiar zoœcia apertures.**
   Keokuk group, Keokuk, Iowa.
   E. O. Ulrich's collection.

(Low Carb. Bryozoa.)

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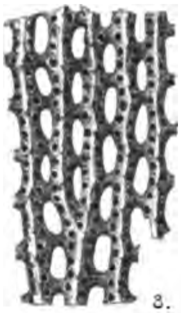

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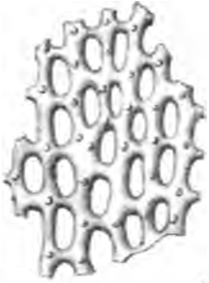

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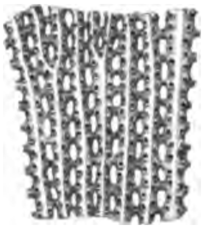

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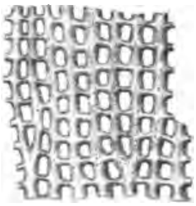

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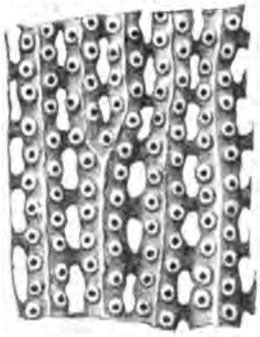

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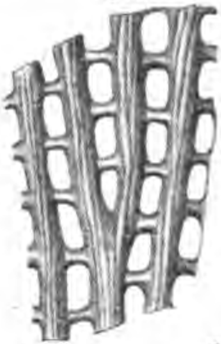

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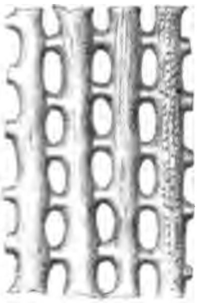

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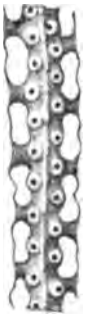

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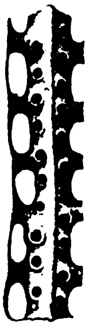

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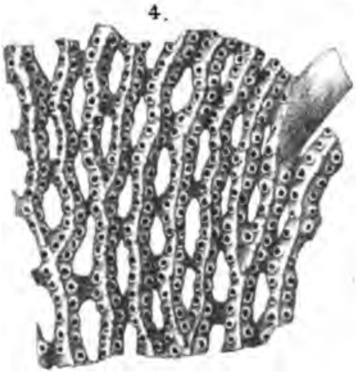

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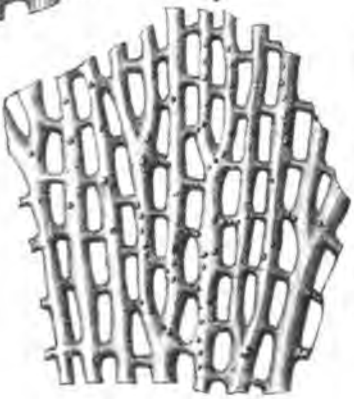

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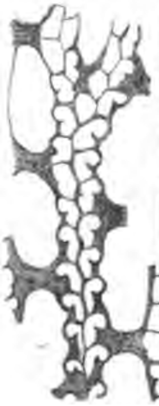

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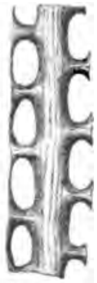

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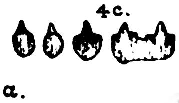

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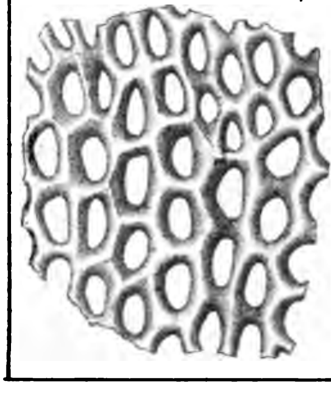

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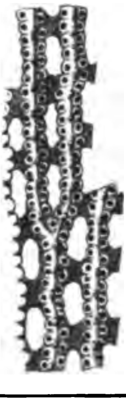

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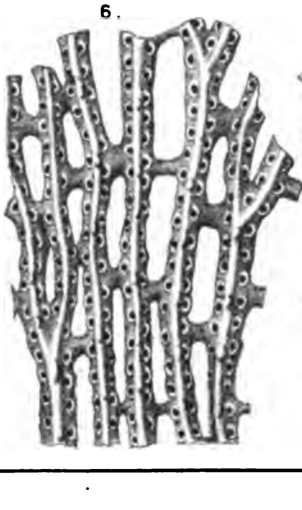

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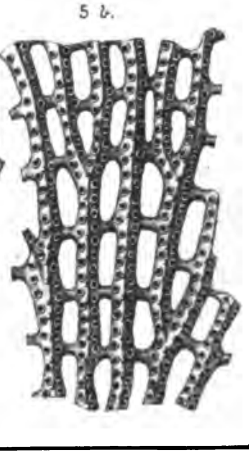

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PLATE LII.

PAGE

Fig. 1. FENESTELLA CINGULATA Ulr 543

1. Obverse surface, x9, of the best specimen seen. In many the dissepiments are more elevated.
1 *a*. Reverse of a variety of this species having longer fenestrules than usual, x9.
1 *b*. Thin section, x18, showing structure just beneath the zoœcia aperture.
1 *c*. One of the zoœcia of fig. 1 *b*, x50, to show the ring of minute tubes.
1 *d*. Another portion of same section where it passes through the zoarium near the reverse face, x18.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.

Fig. 2. FENESTELLA DELICATULA Ulr 549

Fragment of this species showing the obverse side, x9.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 3. FENESTELLA MODESTA Ulr 550

3. Portion of a gutta-percha cast, x9.
3 *a*. One branch of fig. 3 more highly magnified, x18.
3 *b*. From a gutta-percha cast of a fragment showing reverse, x9.
Lower Coal Measures, Knox Co., Ill.
Illinois State Museum.

Fig. 4. FENESTELLA PERMINUTA Ulr 551

4. A small almost complete specimen, x9.
4 *a*. Same, x18, showing the faint carina, and the projecting zoœcia.
4 *b*. One branch of another specimen showing the reverse, x18.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 5. FENESTELLA WORTHENI Ulr 551

5. Portion of a specimen showing the obverse side, x9.
5 *a*. A branch and row of fenestrules of fig. 5, more highly magnified to show more clearly the peculiar keel with its row of minute pores, x18.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 6. FENESTELLA SEVILLENSIS Ulr 552

6. Portion of a fragment, x9.
6 *a*. One branch, x18, to show the peculiarities of the cells and keel.
6 *b*. Reverse, x18.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Plate LII—*Continued.*

PAGE.

Fig. 7. **FENESTELLA MIMICA** Ulr 552
7. Portion of a specimen showing the obverse side, x9.
7 *a*. Several branches of same, x18, for comparison with fig. 6*a*.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 8. **FENESTELLA CONRADI** Ulr 553
8. Obverse face of average specimen, x9. The flattened elevations on the keel should be more conspicuous.
8 *a*. Shows the appearance of the reverse of same, x9.
Upper Coal Measure, Red Oak, Iowa.
E. O. Ulrich's collection.

Fig. 9. **FENESTELLA INÆQUALIS** Ulr. (See also Pl. LIV.) 554
9. An example showing the characters of the obverse face, x9.
3 *a*. Reverse side, x9, showing the distinct granular striæ.
Upper Coal Measure, Sangamon Co., Ill.
Illinois State Museum.

{ Carb Bryozoa. }

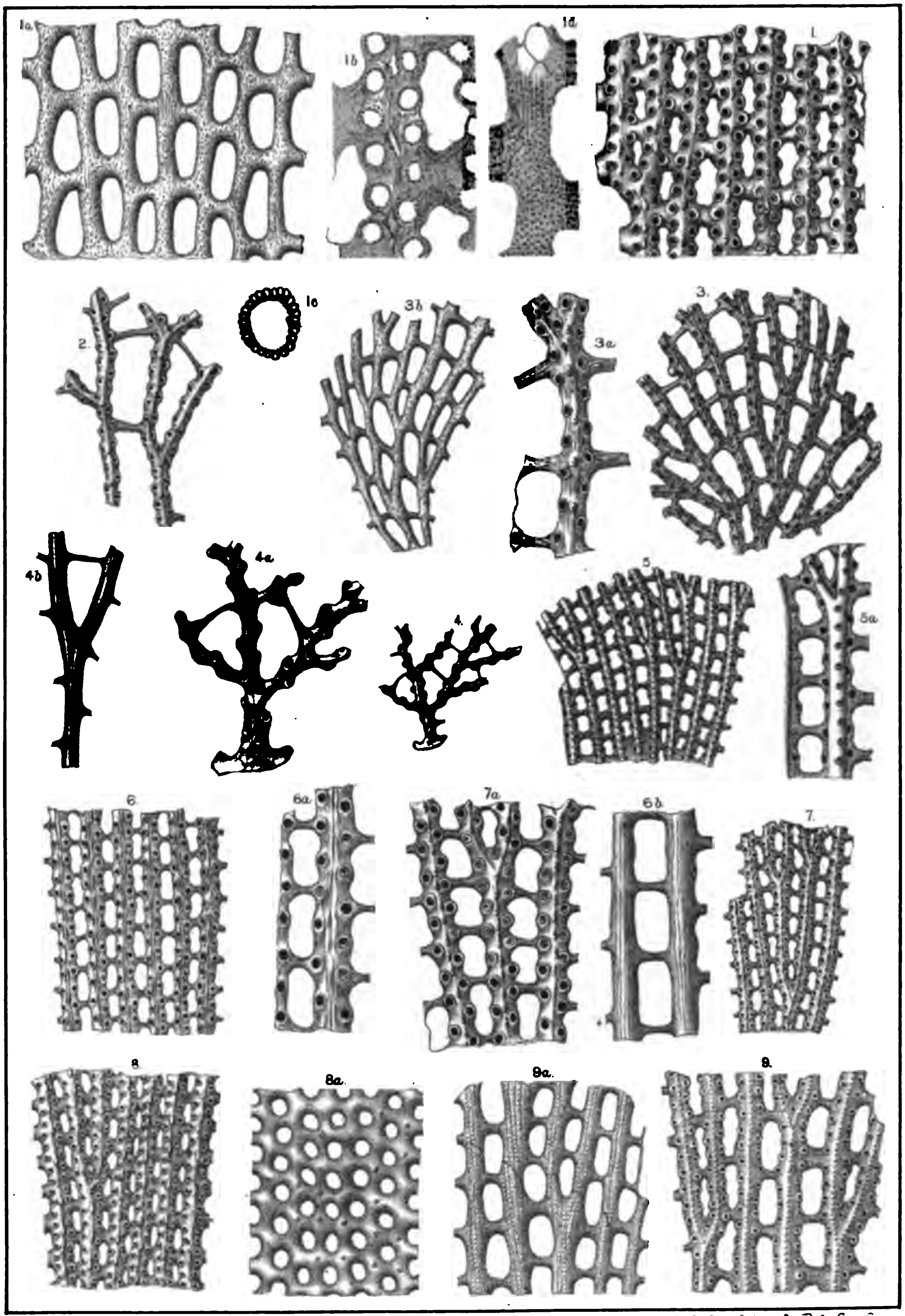

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PLATE LIII.

PAGE.

Fig. 1. PHYLLOPORINA TRENTONENSIS Nicholson 640

1. Thin section cutting the zoarium through the plane of expansion, x18.

1 *a*. Portion of same section showing the tubular zoœcia just beneath their apertures, x18.

1 *b*. Transverse section of a branch, x18.

1 *c*. Vertical section of the branch, x18, showing basal plate, tubular zoœcia and closely tabulated mesopores.

Trenton limestone, Belleville, Canada.

Fig. 2. PHYLLOPORINA RETICULATA Hall 639

2. Vertical section of branch, x25, showing basal plate, tabulated zoœcia, and one of the tubular spines.

2 *a*. Section, x25, cutting the zoarium through the plane of expansion.

Trenton limestone, Trenton Falls, N. Y.

Fig. 3. PHYLLOPORINA CORTICOSA Ulr.. 639

3. Vertical section of branch, x18, showing characters very much as in 1 *c*, only the zoœcial tubes have diaphragms.

3 *a*. Section x18, cutting the zoarium through the plane of expansion showing among other characters the strong mesial plate in the branch to the right.

Trenton shales, Cannon Falls, Minn.

Fig. 4. PHYLLOPORINA ASPERA Hall.. 639

4. Section, x18, showing structure of zoarium just below its celluliferous face.

4 *a*. Portion of same section showing structure of the thick basal plate, x18.

4 *b*. Vertical section of a branch, x25. None of the zoœcia are shown full length.

4 *c*. Transverse section of two branches and dissepiment, x25, the latter apparently non-celluliferous.

Chazy limestone, Mingan, Canada.

Fig. 5. PHYLLOPORINA ASPERATO-STRIATA Hall... 639

5 and 5 *a*. Two portions of a section, x18, passing through the plane of expansion. The first shows structure of zoarium just above the basal plate, while the second shows the structure just beneath the zoœcia apertures, where they are more or less completely isolated by the closed mesopores.

5 *b*. Vertical section of a branch, x18, showing form of zoœcia and the filled mesopores.

Niagara group, Lockport, N. Y.

Plate LIII—*Continued.*

PAGE.

Fig. 6. Drymotrypa dichotoma Ulr. 399

6. Section passing through the plane of expansion, x25. It shows the structure of the zoarium at different levels, and at the top of the right branch, where it is somewhat twisted, the full length of the zoœcial tubes.

Trenton limestone, Montreal, Canada.

Fig. 7. Drymotrypa diffusa Hall 399

7. Transverse section of a branch, x18, showing row of abortive cells on lower side of central lamina, and the distinctly laminated structure of the solid portions of the zoarium.

7 *a*. A tangential section, x18.

7 *b*. Vertical section, x18, showing thick basal plate, the form of the zoœcia and the abortive cells.

Niagara group, Lockport, N. Y.

Fig. 8. Mitoclema cinctosum Ulr 369

8. Vertical section of a branch, x18, showing the long tubular, thinwalled zoœcia, and three cycles of apertures.

8 *a*, 8 *b*. Two transverse sections, x18, the first passing through the stem just beneath, the second just above a ring of apertures.

Chazy limestone, High Bridge, Ky.

Fig. 9. Diploclema trentonense Ulr 369

9. Tangential section of a branch, x18, showing the zoœcia cut at varying levels between the apertures and the median line.

9 *a*, 9 *b*, 9 *c*. Three transverse sections, x18, showing the compressed form of the branches, and slight modifications in structure.

Trenton group, Trenton Falls, N. Y.

Fig. 10. Diploclema sparsum Hall 369

Tangential section, x18, showing structure similar to lower half of fig. 9.

Niagara group, Lockport, N. Y.

Fig. 11. Protocrisina exigua Ulr. (See also Pl. XXIX.) 405

11. A deep tangential section, x18, showing the tubes that open on the side of the branches throughout their length.

11 *a*. Portion of same section where it passes just beneath the mouths of the dorsal rows of cells, x18.

11 *b*. Vertical section, x18.

11 *c*. The same kind of section as fig. 11, taken from Trenton Falls, N. Y. specimen, in which the zoœcia are a little shorter than usual.

11 *d*, 11 *e*. Two transverse sections, x18, showing the four ranges of zoœcia, and the thick outer walls.

Trenton limestone, Montreal, Canada, and Trenton Falls, N. Y.

VOL. VIII. GEOLOGICAL SURVEY OF ILLINOIS. PL. LIII.

(Silurian Bryozoa)

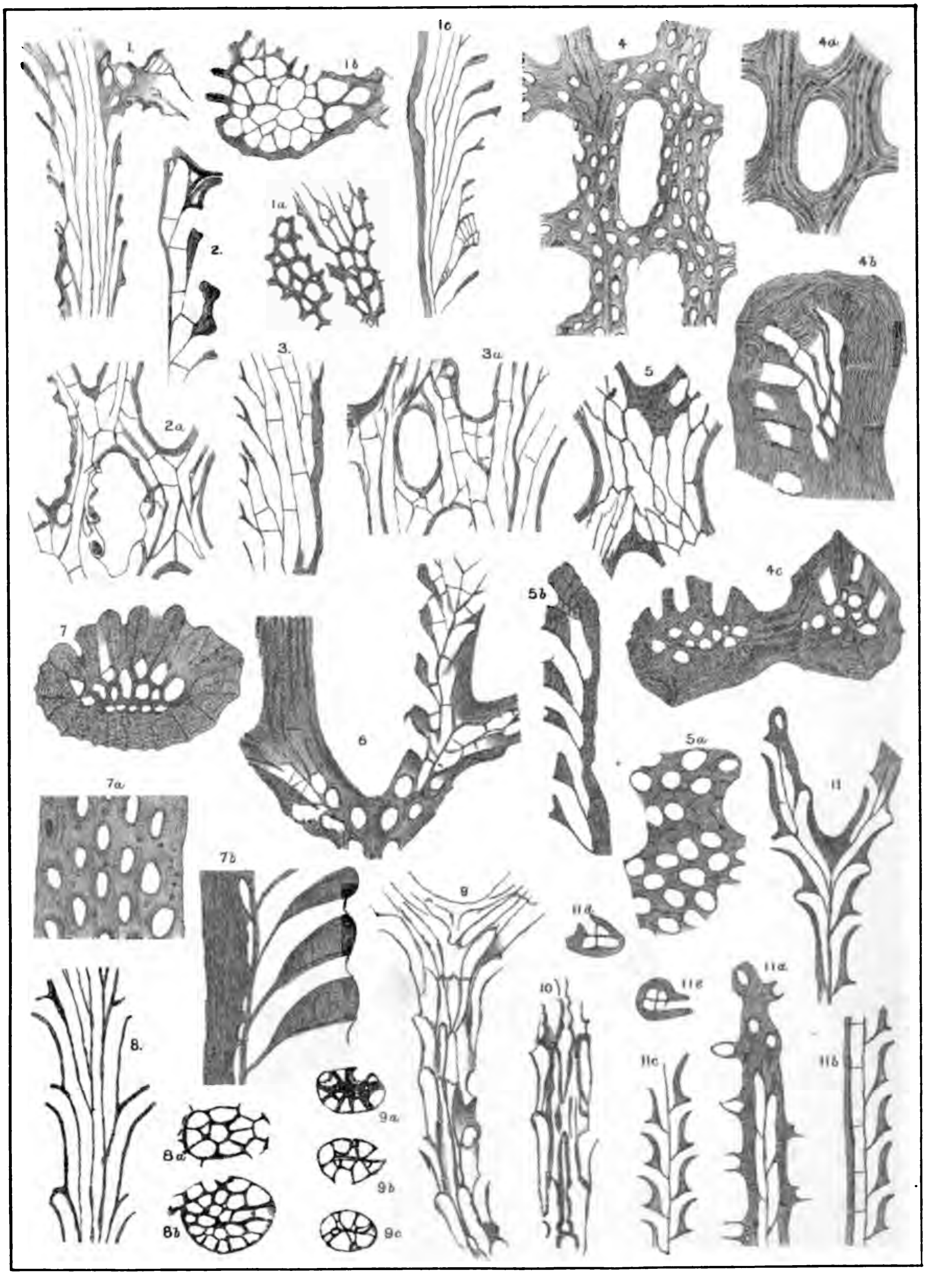

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PLATE LIV.

PAGE.

Fig. 1. PHYLLOPORINA DAWSONI Ulr. 331

1, 1 *a*, 1 *b*. Sections passing through the branches near the middle of their thickness, x18.

1 *c*. A slightly oblique section, showing mature form of zooecial apertures, and accessory pores, x18.

1 *d*. A vertical section.

1 *e*, 1 *f*, 1 *g*, 1 *h*, 1 *i*. Five transverse sections showing the moderate keel. The zooecia appear different in each because each section cuts them at a different point in their length, x18.

Fig. 2. FENESTELLA BELLISTRIATA? Hall 331

Section showing straight mesial line, and oblique walls, between the ends of the zooecia, x18. Compare with figs. 1 *b* and 4.

Niagara group, Waldron, Ind.

Fig. 3. FENESTELLA VERA Ulrich. (See also Pl. XLIV) 535

Section, x18, showing structure at different levels.

Hamilton group, Buffalo, Iowa.

Fig. 4. FENESTELLA INÆQUALIS Ulr. (See also pl. LII) 554

4. Deep section, x18, showing primitive portion of zooecia with the inferior hemiseptum in those of the right branch, and the inflections produced by the superior one in those of the left branch.

4 *a*. Portion of section nearer the level of the cell apertures, x18. The depths at which the section passes through the branch increases gradually from below upwards.

Upper Coal Measures, Sangamon Co., Ill.

Fig. 5. FENESTELLA REGALIS Ulrich. (See also pl. L) 538

Section, x18, showing the large zooecia and the minute tubuli which pierce the outer crust.

Keokuk group, Kings Mountain, Ky.

Fig. 6. ISOTRYPA GOTHLANDICA Ulr 678

6. Horizontal section, x18, showing form and arrangement of cells and, on the left side, the lower portion of the keel.

6 *a*, 6 *b*, 6 *c*. Represent three transverse sections; *a*, a branch with dissepiments and keel; *b*, two branches with the keel united; and *c*, a branch just about to bifurcate, with two keels.

Upper Silurian, Gotland.

Plate LIV—*Continued.*

PAGE.

Fig. 7. **FENESTRAPORA OCCIDENTALIS** Ulr. (See also pl. XLIV) 558

7. A vertical section through height of branch and keel, x18.

7 *a*. Horizontal section, showing only the keel with three of the shallow cells, x18.

7 *b*. Transverse section of two branches with keels, x18.

7 *c*. Part of a vertical section of the basal portion of the zoarium, x18. At the upper left hand corner is represented a portion of the outer subsolid layer. In the lower portion of the figures is shown some loose vesicular tissue which fills the bottom of the infundibular stalk, while the central portion of the figure is occupied by a branch with a number of cells. Between the branch and the outer membrane the space is filled by vesicular tissue. x18.

7 *d*. Horizontal section of the non-celluliferous face, showing large accessory cells, and two sets of minute tubuli, x18.

7 *e*. Horizontal section showing the characters of the zoarium at different levels, x18.

Fig. 8. **SEMICOSCINIUM RHOMBICUM** Ulr. (See also pl. XLIV) 556

Horizontal section of an old example, x18. The half of the figure to the right represents a portion of the section where it passes through the region included between the cell apertures and the tops of the keels. As shown, this region is occupied by irregular vesicles.

Hamilton group, Buffalo, Iowa.

Fig. 9. **SEMICOSCINIUM SP. UNDET.**

Transverse section of a branch showing a thin knife-edge keel, x18. In other species of this genus the keel is expanded or even flattened at the summit.

Hamilton group, Bake Oven, Ill.

Fig. 10. **HEMITRYPA TENERA** Ulrich. (See also pl. XLIV) 559

10. Horizontal section, x18, showing only the principal bars on the right side, and the secondary bars and scalæ of the superficial network on the left side.

10 *a*. Horizontal section of the branches, x18.

10 *b*. Vertical section of a branch, x18; the lower series of openings represent the zoœcia, while the upper series represent the spaces between the columns which support the superficial structure.

10 *c*. Transverse section of a branch through one of the columns, x18.

Hamilton group, Davenport Iowa.

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(Fenestellidae.)

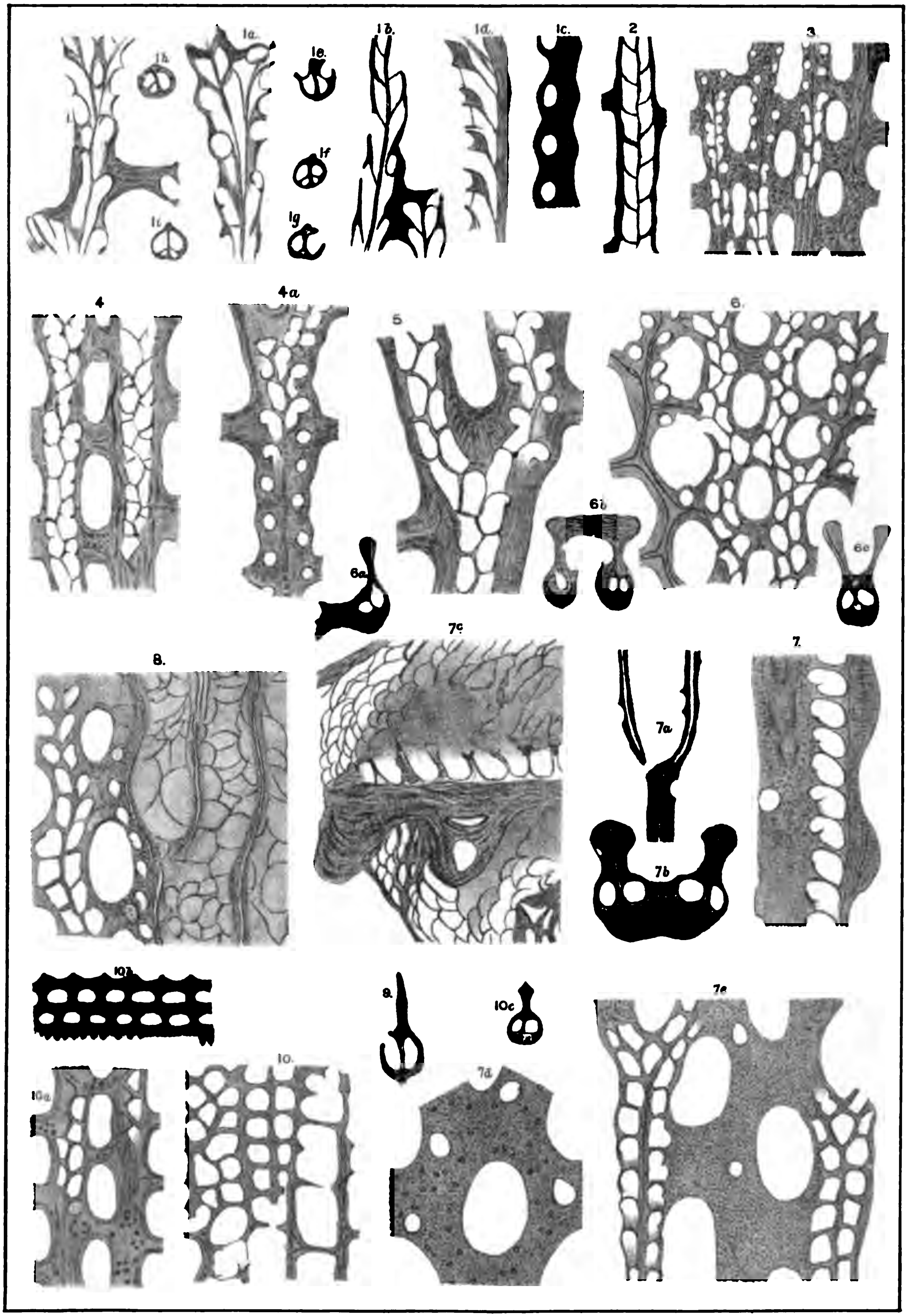

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PLATE LV.

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Fig. 1. POLYPORA INCEPTA Hall? 358
Horizontal section showing characters of zoœcia at successive stages, x18.
Niagara group, Waldron, Ind.

Fig. 2. POLYPORA SHUMARDI Prout... 586
2. Horizontal section, cutting the zoœcia transversely at a point midway between their apertures and the basal layer, x18.
2 *a*. Portion of same section where the characters of the cells just beneath their mouths, is shown, x18.
2 *b*, Basal layer, x18.
2 *c*. A vertical section, x18, showing the nearly erect zoœcia.
2 *d*. Transverse section of two branches united by a dissepiment, x18.
Upper Helderberg group, Utica, Ind.

Fig. 3. POLYPORA CORTICOSA? Ulr. (See also Pl. LX) 596
Horizontal section, x18, showing structure of obverse half of zoarium.
Chester group, Litchfield, Ky.

Fig. 4. POLYPORA CESTRIENSIS Ulr. (See also Pl. LX).................................. 594
4. Horizontal section of two branches just above a bifurcation, x18.
4 *a*. Horizontal section of a large branch, x18.
4 *b*. Another portion of the branch shown in 4 *a*, showing the zoarial characters just beneath the zoœcial apertures.
Chester group, Sloan's Valley, Ky.

Fig. 5. FENESTRALIA SANCTI-LUDOVICI Prout. (See also Pl. LIX) 604
Horizontal section, x18, showing median keel and two rows of cells on each side.
Warsaw beds, Warsaw Ill.

Fig. 6. THAMNISCUS SEVILLENSIS Ulr. (See also Pl. LXII)..........................610,727
Horizontal section, x18.
Lower Coal Measures, Seville, Ill.

Fig. 7. LYROPORA QUINCUNCIALIS Hall. (See also Pl. LVIII). 583
7. Horizontal section, x18. Shows the inferior hemiseptum very clearly. In most cases it divides the cell into two distinct portions.
7 *a*. Portion of a horizontal section, x18, showing characters just beneath the cell apertures.
7 *b*. Vertical section, x18, showing form of zoœcia and inferior hemisepta.
7 *c*. Transverse section of two branches, x18.
Chester group, Sloan's Valley, Ky.

Plate LV—*Continued.*

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Fig. 8. **LYROPORA OVALIS** Ulr. (See also Pl. LVIII) 585
Vertical section showing large cells with well developed hemisepta, x18.
Chester group, Litchfield, Ky.

Fig. 9. **PHYLLOPORA SUPERBA** Ulr. (See also Pl. XLIV) 613
9. Vertical section, x18, showing large erect zoœcia.
9 *a*. Horizontal section, x18. The lower half represents the dense dermal layer, while in the upper half the zoœcia are shown.
Hamilton group, Erie Co., N. Y.

Fig. 10. **PHYLLOPORA**? sp. indet. 612
Horizontal section, x18, showing the structure of the zoœcia at levels varying between their apertures and the basal layer.
Hamilton group, Widder, Canada.

VOL. VIII. **GEOLOGICAL SURVEY OF ILLINOIS.** PL. LV.

(Fenestellidae.)

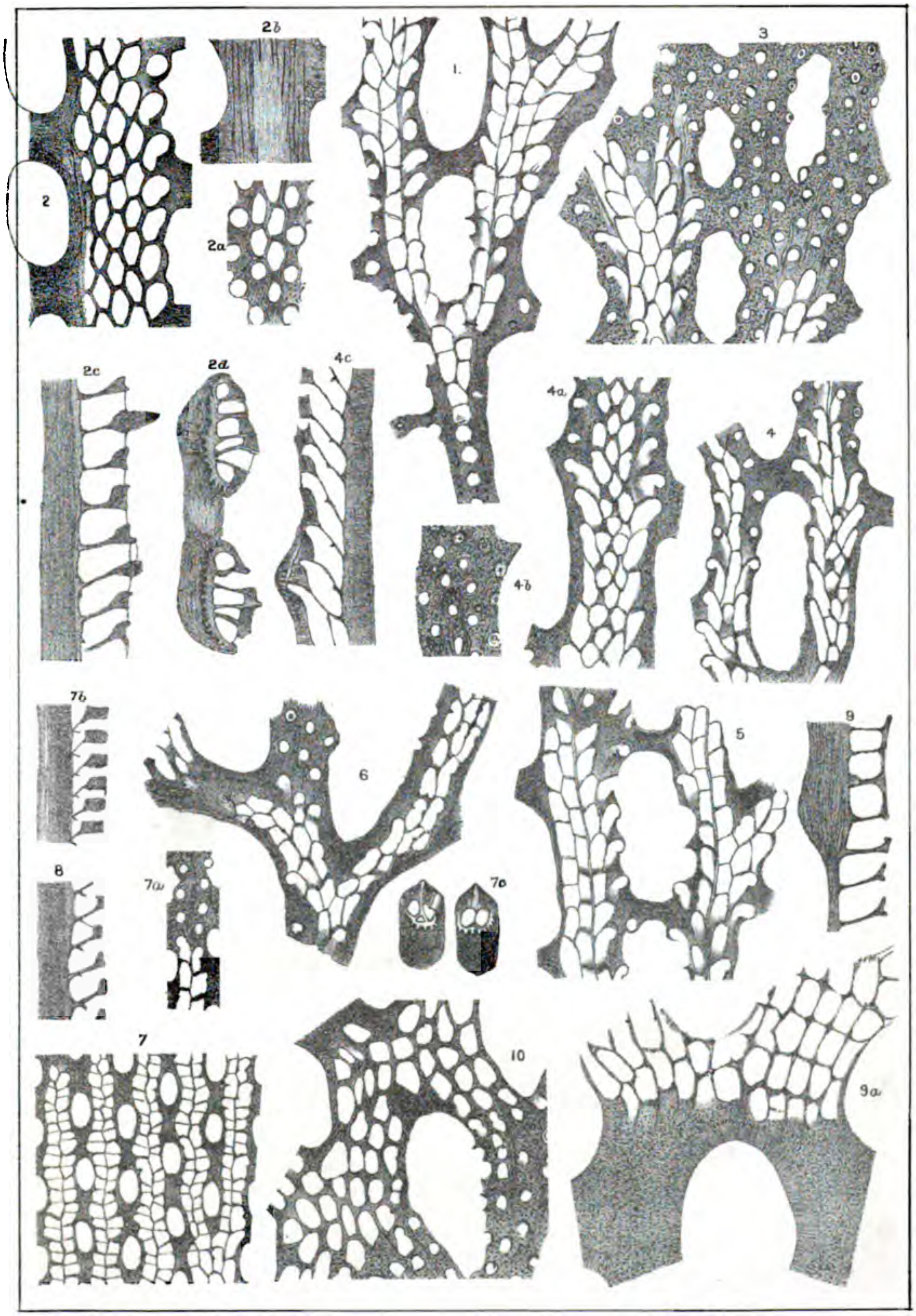

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PLATE LVI.

PAGE

Fig. 1. Acanthocladia anceps Schlotheim.. 635
1. Horizontal section of main stem and portions of two pinnæ. x18. Shows in the lower part the two principal ranges of zoœcia.
1 *a* and 1 *b*. Vertical and transverse section of midrib, x18.
1 *c*. Slightly oblique transverse section of one of the lateral branches, x18.
Permian, Poesneck, Germany.

Fig. 2. Pinnatopora elegans Young and Young 615
Horizontal section of midrib and pinnæ, x18, showing two ranges of zoœcia in both.
Carboniferous shales, Scotland.

Fig. 3. Pinnatopora retroflexa Y. & Y. 615
Horizontal section of midrib and pinnæ, x18, showing the lozenge-shaped zoœcia and their peculiar arrangement in the midrib.
Carboniferous shales, Scotland.

Fig. 4. Pinnatopora laxa Y. & Y. 615
4. Horizontal section, x18, showing a uniserial arrangement of the zoœcia in both the midrib and pinnæ.
4 *a*. A deeper portion of same section where it passes through the basal layer.
Carboniferous shales, Scotland.

Fig. 5. Pinnatopora conferta Ulrich. (See also Pl. LXVI.).......................... 618
Horizontal section, x18, showing the large biserially arranged zoœcia in the midrib.
Keokuk group, Bentonsport, Iowa.

Fig. 6. Pinnatopora trilineata (Meek). 620
Horizontal section, x18, showing the midrib with several pinnæ and the base of a lateral branch. The hemisepta are better developed in this species than in any other of this family.
Coal Measures, Springfield, Ill.

Figs. 7 and 8. Septopora subquadrans, Ulr. (See also Pl. LXIV.)................. 629
7. Horizontal section, x18. The branches are closer together than usual.
8. Horizontal section of another branch, x18.
Chester group, Chester, Ill.

Plate LVI—*Continued.*

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Fig. 9. **SEPTOPORA ROBUSTA** Ulr. (See also Pl. LXIV.) 633
- 9. Horizontal section, x18.
- 9 *a*. Transverse section of a branch with dissepiment, x18.
- 9 *b*. Transverse section of a branch, x18.
- 9 *c*. Vertical section of a branch, x 18, showing nearly direct zoœcia and the thin interspaces.

Upper Coal Measures of Illinois.

Fig. 10. **SEPTOPORA ROBUSTA** var. **INTERMEDIA**. (See also Pl. LXIV.) 634

Horizontal section, x24, showing long uniting pinnæ or dissepiments.

Chester group, Litchfield, Ky.

Fig. 11. **SEPTOPORA BISERIALIS** Swallow 631

Horizontal section, x18, showing the dotted interspaces and accesssory pores.

Upper Coal Measures, Kansas City, Mo.

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GEOLOGICAL SURVEY OF ILLINOIS.

{Acanthocladiidae.}

PL. LVI.

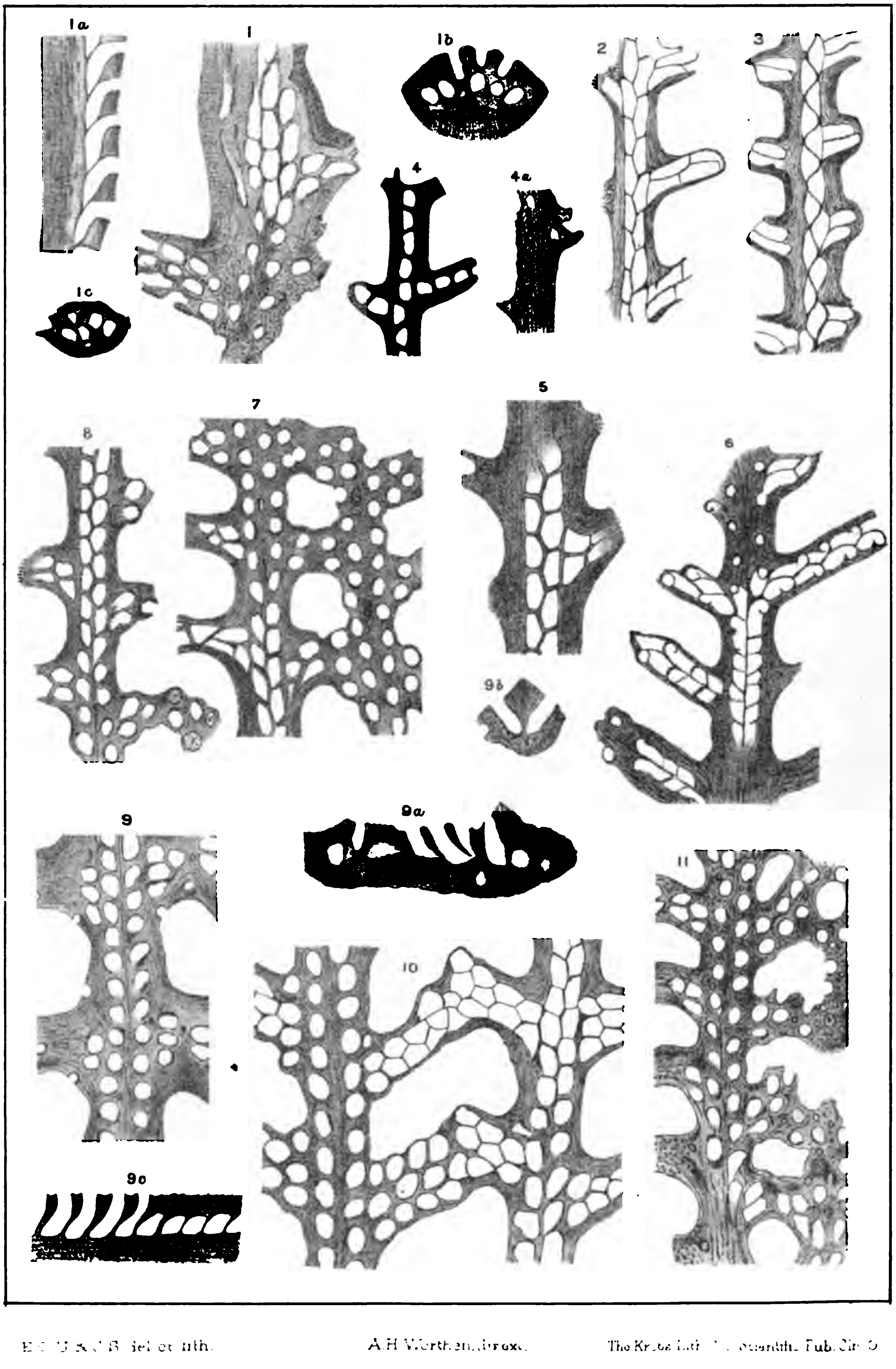

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PLATE LVII.

PAGE.

Fig. 1. HEMITRYPA PROUTANA Ulr 560

1. Celluliferous surface, with superficial net work, x9.
1 *a*. Non-celluliferous surface of an average example, x9.
1 *b*. Vertical section of branch and superficial network, x18. Slightly oblique.
1 *c*. Transverse section of several branches and superficial network, x18. The branch on the right is about to bifurcate.
Warsaw beds, Warsaw, Ill.
E. O. Ulrich's collection.

Fig. 2. HEMITRYPA PROUTANA var. NODULOSA Ulr 562

2. Superficial net-work, x9, showing the floriform interstice.
2 *a*. Celluliferous face of branches, x9.
2 *b*. Non-celluliferous face of branches, x9, showing the small nodes, and the relative size of branches and fenestrules.
2 *c*. Thin section showing structure of zoarium just beneath the zoœcia, x18.
Keokuk group, Keokuk, Iowa.
E. O. Ulrich's collection.

Fig. 3. HEMITRYPA NODOSA Ulr 562

3. Non-celluliferous face of branches, x9, showing nodose character of branches.
Keokuk group. Bentonsport, Iowa.
Illinois State Museum.

Fig. 3 *a*. HEMITRYPA ASPERA? Ulr 563

Portion of the reverse of a frond where the nodes are on the branches instead of the dissepiments, x9. On other parts they occupy the usual position.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.

Fig. 4. HEMITRYPA ASPERA Ulr 563

4. The reverse aspect of the basal portion of a frond. Natural size.
4 *a*. Obverse side of same, x9, showing the character of the superficial network.
4 *b*. Reverse side of same, x9, showing the thick branches and dissepiments and the subcircular fenestrules.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.
4 *c*. Superficial net-work of another example.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.
4 *d*. Non-celluliferous side of same, x9.
4 *e* and 4 *f*. Thin sections showing structure of the cortical or reverse side of the branches, x18.

Plate LVII—*Continued.*

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Fig. 5. HEMITRYPA PROUTANA var. VERMIFERA Ulr. 561

5. Small portion, natural size, of a large specimen, showing the vermiform tubes on the reverse side of the zoarium.

5 *a*. Portion of same, x9, showing several of the tubular bodies.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

Fig. 6. HEMITRYPA PERSTRIATA Ulr. 564

6. Reverse aspect of a specimen, x9, showing the relative size of the branches and fenestrules, the depressed dissepiments and the strong striæ and spines. The latter are often stronger than here represented.

6 *a*. This section showing structure of zoarium at different levels, x18.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Fig. 7. HEMITRYPA PATERIFORMIS Ulr. 564

7. Natural size view of specimen.

7 *a*. Obverse or upper face, x9, showing character of superficial net-work.

7 *b*. Portion of the non-celluliferous or lower side of same about midway between the base and outer margin, x9.

7 *c*. Thin section showing structure of zoarium at different levels, x18.
Keokuk group, Keokuk, Iowa.
E. O. Ulrich's collection.

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PL. LVII

(Low Carb Bryozoa)

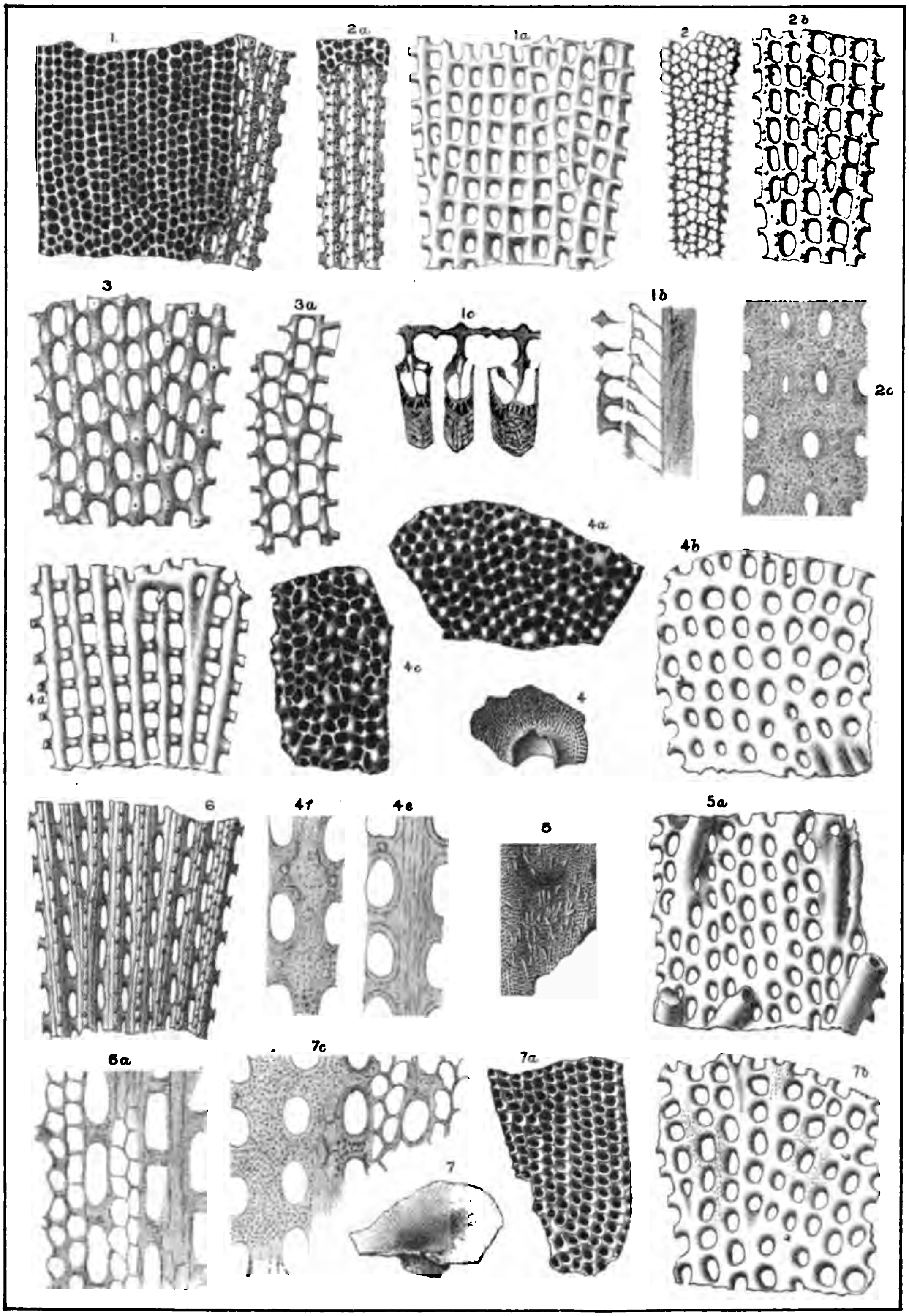

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PLATE LVIII.

PAGE.

Fig. 1. LYROPORA RANOSCULUM Ulr. 581

1. The obverse side of a large specimen showing the basal portion of the support and a small portion of the net-work. Natural size. The sectional view shows the extent to which the margin of the net-work is covered.

1 *a*. The reverse side of another fragment of the support showing the usual prominence of the basal part, natural size.

1 *b*. Obverse face of a branch showing the rather irregular arrangement of the zoœcia and tubercles, x18.

1 *c*. Reverse face of a frond, x9, showing the subcircular fenestrules, and the fine vermicular markings of the surface.

Fig. 2. LYROPORA SUBQUADRANS Hall 582

2. A specimen showing the attenuated base, natural size. This example is unusually strong.
Chester, Illinois.
E. O. Ulrich's collection.

2 *a*. The obverse side of a younger example, preserving a large portion of the fenestrated expansion. Natural size.
Chester, Illinois.
Illinois State Museum.

2 *b*. Another example, similar to fig. 2, but not plicated. Natural size.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

2 *c*. Portion of fig. 2 *a*, showing the relative size and character of the branches and fenestrules, x9.

2 *d*. Portion of the obverse face, x9.

2 *e*. One branch of fig. 2 *d*, x18, to show the arrangement of the zoœcia and row of nodes, and the granulose surface.

Fig. 3. LYROPORA QUINCUNCIALIS Hall. (See also Pl. LV) 583

3. The obverse side of the support and a small portion of the fenestrated expansion. Natural size.
Chester, Illinois.
Illinois State Museum.

3 *a* and 3 *b*. Natural size. Reverse and profile views of another specimen from the same locality and collection.

3 *c* (*e* on plate). Poriferous side of net-work, x9.

3 *d*. Reverse face of a fragment, x9.

Plate LVIII—*Continued.*

PAGE.

Fig. 4. LYROPORA DIVERGENS Ulr. 584

4 and 4 *a*. Two specimens of this species, natural size.
Chester, Illinois.
Illinois State Museum.

4 *b*. Obverse face, x9, showing two and three ranges of zoœcia, and other peculiarities of the species.

4 *c*. Portion of the reverse side of a large expansion from Chester, Ill., which probably belongs to some other species. x9. In its measurements it agrees more closely with *L. quincuncialis*.

4 *d*. Reverse aspect of the frond of a more typical specimen, x9.

Fig. 5. LYROPORA OVALIS Ulr. (See also Pl. LV) 585

5. View of the only specimen seen. Natural size.

5 *a*. Surface of same, x9, showing the characters of the reverse face of the frond.

5 *b*. Thin section, x18, showing two ranges of cells, their large size and structure at different levels.
Chester group, Litchfield, Ky.
E. O. Ulrich's collection.

GEOLOGICAL SURVEY OF ILLINOIS.

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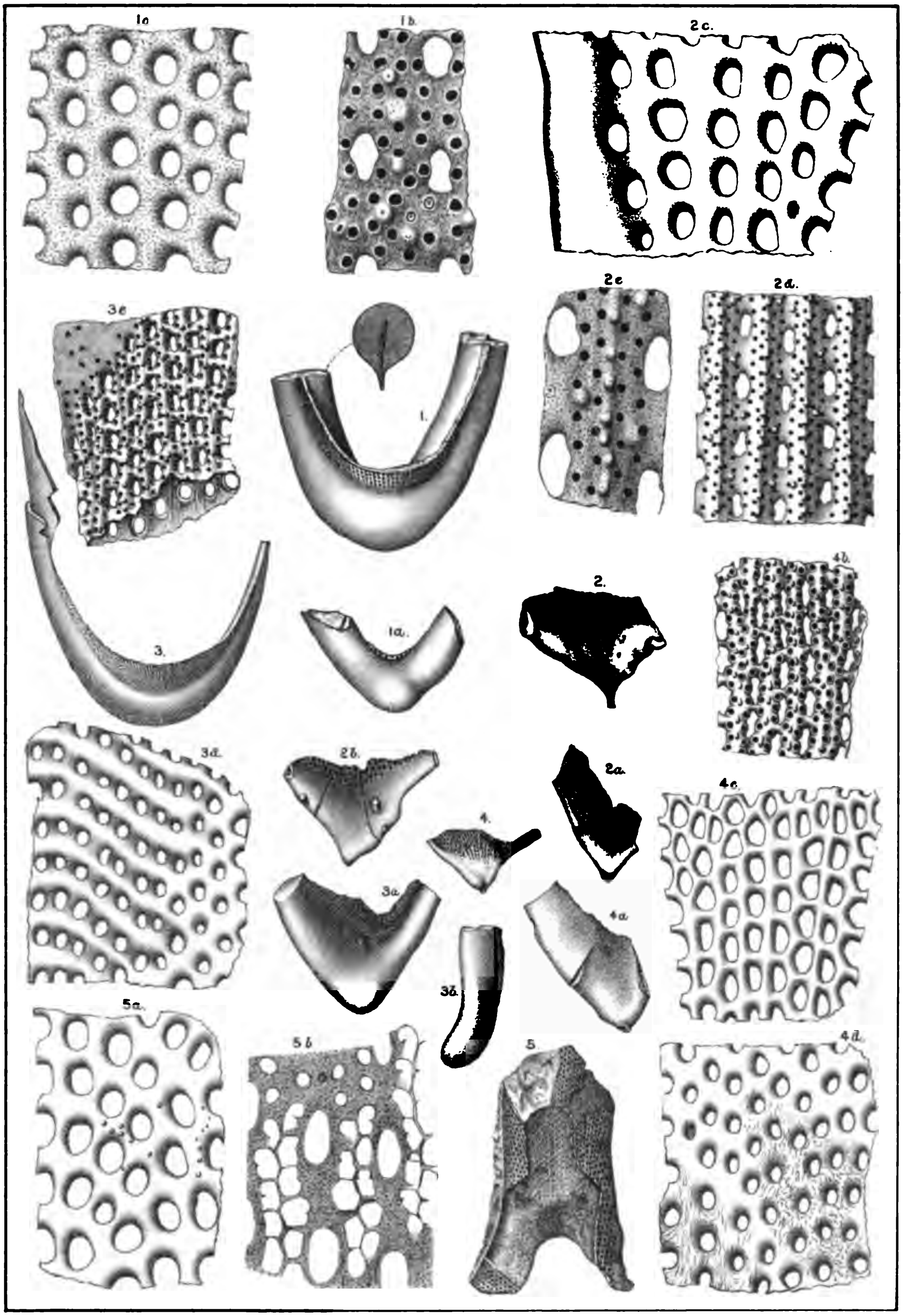

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PLATE LIX.

PAGE

Fig. 1. **FENESTRALIA SANCTI-LUDOVICI var. COMPACTA Ulr** 605
1. Poriferous face, x9, showing the four ranges of cells and the relative size of branches and fenestrules.
St. Louis group, Elizabethtown, Ky.
E. O. Ulrich's collection.

Fig. 2. **POLYPORA BURLINGTONENSIS Ulr** 587
2. Specimen showing non-poriferous side. Natural size.
2 *a*. Portion of same, x9.
Burlington limestone, Henderson Co., Ill.
Illinois State Museum.

Fig. 3. **POLYPORA MAC-COYANA Ulr** 588
3. Small specimen from Keokuk, Iowa, showing poriferous side. Natural size.
3 *a*. Portion of same, x9, showing the occasional tubercles.
3 *b*. Another portion, x18.
3 *c*. Portion of a stronger example with stronger tubercles, x9.
Nauvoo, Ill.
3 *d*. Tangential section, x18, shows character of cells at different depths.
Keokuk group.
E. O. Ulrich's collection.

Fig. 4. **POLYPORA SIMULATRIX Ulr** 589
4. Poriferous side of an example, natural size. It is partially covered by a species of *Eridopora*,
4 *a*. Reverse side of a small fragment, natural size, showing the base of one of the root-like processes.
4 *b*. Upper extremity of fig. 4, x9, showing the perfect appearance of the zoœcia apertures.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.

Fig. 5. **POLYPORA HALLIANA Prout** 587
5. Obverse face of an almost perfect frond, x9, showing the comparatively large granules which occupy the interspaces.
5 *a*. Reverse of same, x9, showing the flattened sides of the branches and other features.
5 *b*. Thin section, x 18, showing structure of zoarium at different levels.
5 *c*. Cortical substance as shown in thin sections, x 18.
Keokuk group, Keokuk, Iowa.
Illinois State Museum.

Plate LIX—*Continued.*

PAGE.

Fig. 6. POLYPORA RETRORSA Ulr 591

6. Obverse surface, x9.

6 *a*. Portion of same, x18, showing the obliquely elevated peristomes.

6 *b*. Reverse face of another example, x9. showing the oval fenestrules and nodulose branches.

6 *c* and 6 *d*. Thin sections showing the structure of the zoarium at different levels, x18.

Keokuk group, Keokuk, Iowa.

E. O. Ulrich's collection.

GEOLOGICAL SURVEY OF ILLINOIS.

(Low Carb Bryozoa.)

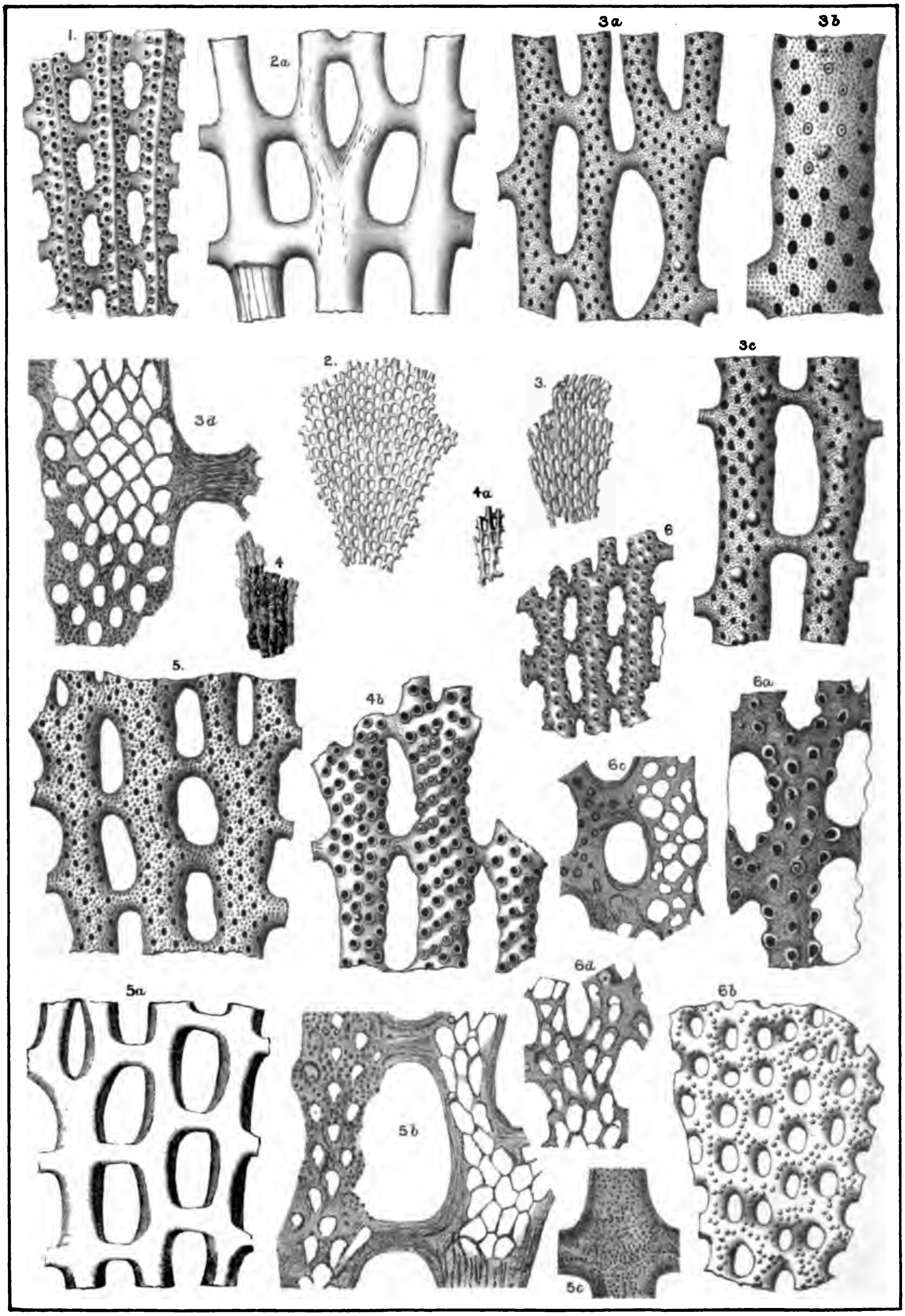

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PLATE LX.

PAGE

Fig. 1. POLYPORA RADIALIS Ulrich.. 591
1. Obverse surface, x9.
1 *a*. Portion of same, x 25, showing some of the zoœcia apertures entirely closed and others with the radial denticles.
1 *b*. Reverse, x9.
1 *c*. Horizontal section, x18.
1 *d*. Deep tangential section, x18, showing structure of basal layer.
Keokuk group, Keokuk, Iowa.
E. O. Ulrich's collection.

Fig. 2. POLYPORA VARSOVIENSIS Prout.. 593
2. Perfect obverse surface, x9, showing relative size of branches and fenestrules and distribution of zoœcia apertures. Some of them preserve the covers.
2 *a*. Usual appearance of the obverse side, x9.
2 *b*. Reverse, x9.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

Fig. 3. POLYPORA SPININODATA Ulr.. 594
Reverse, x9, showing the strong hollow nodes opposite the dissepiments.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

Fig. 4. POLYPORA BISERIATA Ulr.. 592
4. Obverse surface, x9, showing opercula and relative size of branches and fenestrules.
4 *a*. Obverse side of another example, x9, with zoœcia apertures open.
4 *b*. Reverse. x9, showing the usual flattening of the branches before bifurcation.
Warsaw limestone, Monroe Co., Ill.
Illinois State Museum.

Fig. 5. POLYPORA CORTICOSA Ulr. (See also Pl. LV, and LXI)........................... 596
5, 5 *a*, 5 *b*, 5 *c*. Four specimens, natural size.
Chester group, Chester, Ill.
Illinois State Museum.

Plate LX—*Continued.*

PAGE

Fig. 6. POLYPORA COMPLANATA Ulr. 597

6. Obverse face of a nearly perfect frond, showing base, extremely wide dissepiments, and the small fenestrules. Natural size.

6 *a*. Surface of same, x9, showing cells in different states of preservation, and the relative size of branches, fenestrules, and dissepiments.

6 *b*. Transverse section, x18, showing flatness of obverse side of branches.

6 *c*. Vertical section of a branch, x18, showing strong inferior hemisepta and form of zooecia.
Chester group, Chester, Ill.
Illinois State Museum.

Fig. 7. POLYPORA CESTRIENSIS Ulr. (See also Pl. LV) 594

7. Natural size view of specimen from near Anna, Union Co., Ill.
Illinois State Museum.

7 *a*. Upper extremity of same, x9, showing appearance of perfect young examples.

7 *b*. Natural size view of specimen from Sloan's Valley, Ky.
E. O. Ulrich's collection.

7 *c*. Surface of same, x9, showing appearance of branches near base of fronds.

Fig. 8. POLYPORA TUBERCULATA Prout 595

Obverse surface, x9, of a worn example of this species. More perfect specimens since examined show that the tubercles are more numerous and stronger, and the zooecia apertures with peristomes as at the lower end of fig. 7*a*.
Chester group, Chester, Ill.
Illinois State Museum.

(Low Carb Bryozoa.)

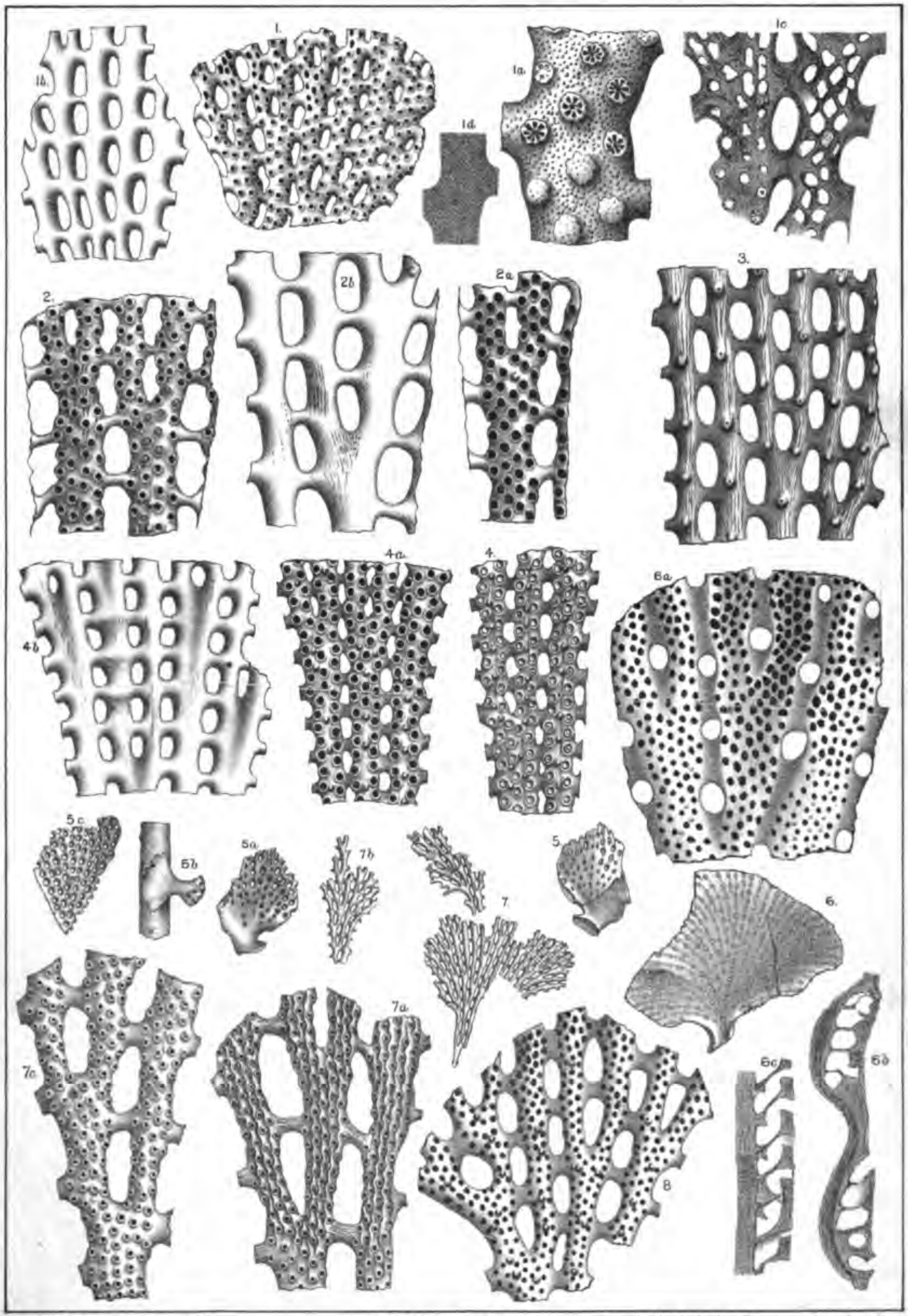

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PLATE LXI.

PAGE.

Fig. 1. POLYPORA CORTICOSA Ulr. (See also Pl. LV and LX). 596
Obverse surface of specimen represented by fig. 5, Pl. LX, x9. Over the lower half the apertures are covered by a dense deposit.

Fig. 2. POLYPORA SPINULIFERA Ulr. 598
2. Obverse, x9, showing the relative size of branches, dissepiments, and fenestrules, and the distribution of the zoœcia apertures and small tubercles.
2 *a*. Portion of fig. 2, x18.
Chester group, Chester, Ill.
Illinois State Museum.

Fig. 3. POLYPORA SPINULIFERA var. 599
3. Branch, x18, showing more prominent peristomes, and only three ranges of zoœcia.
3 *a*. Reverse of same specimen, x9, showing comparatively thin branches and subquadrate fenestrules.
Upper Coal Measures, Montgomery Co., Ill.
Illinois State Museum.

Fig. 4. POLYPORA SPINULIFERA var. Ulr. 599
4. Poriferous surface, x9.
4 *a*. Reverse, x9, showing rounded and smaller fenestrules than fig. 3 *a*.
Upper Coal Measures near Red Oak, Iowa.
E. O. Ulrich's collection.

Fig. 5. POLYPORA APPROXIMATA Ulr. 599
5. Reverse, x9.
5 *a*. Poriferous surface, x9.
Chester group, Litchfield, Ky.
E. O. Ulrich's collection.

Fig. 6. POLYPORA SUBMARGINATA Meek. 602
6. Reverse side of an example, natural size.
6 *a*. Obverse face of another specimen, natural size.
6 *b*. Portion of 6 *a*, x9, showing the typical arrangement of zoœcia and tubercles.
Upper Coal Measures, Macoupin Co., Ill.
Illinois State Museum.

Fig. 7. POLYPORA DISTINCTA Ulr. 603
7. Fragment of this species, showing the obverse side, of the natural size.
7 *a*. Several branches of same, x9, showing the narrow fenestrules, and arrangement of zoœcia apertures.
Upper Coal Measures, Springfield, Ill.
E. O. Ulrich's collection.

Plate LXI—*Continued.*

PAGE.

Fig. 8. POLYPORA CRASSA Ulr. (provisional).. 603

8. Natural size view of the only specimen seen.

8 *a*. Surface of same, x9. The zoœcia apertures are obscured in part by abrasion and by a dense cortical deposit.
Upper Coal Measures, Sugar Creek, Sangamon Co., Ill.
Illinois State Museum.

Fig. 9. POLYPORA NODOCARINATA Ulr.. 601

9. Obverse surface, x9, of a well preserved example.

9 *a*. Obverse side of another portion of same, x9, where the specimen seems to have suffered from abrasion.
Upper Coal Measures, Crooked Creek, near Centralia, Ill.
Illinois State Museum.

Fig. 10. POLYPORA GRACILIS Prout.... 590

10. Natural size view of an example of this species. The tubercles are drawn a little too strong.
Keokuk group.
Illinois State Museum.

10 *a*. Obverse surface, x9, of a well preserved fragment from King's Mountain, Ky., which shows no tubercles.
E. O. Ulrich's collection.

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GEOLOGICAL SURVEY OF ILLINOIS.

PL. LXI.

(Fenestellidae.)

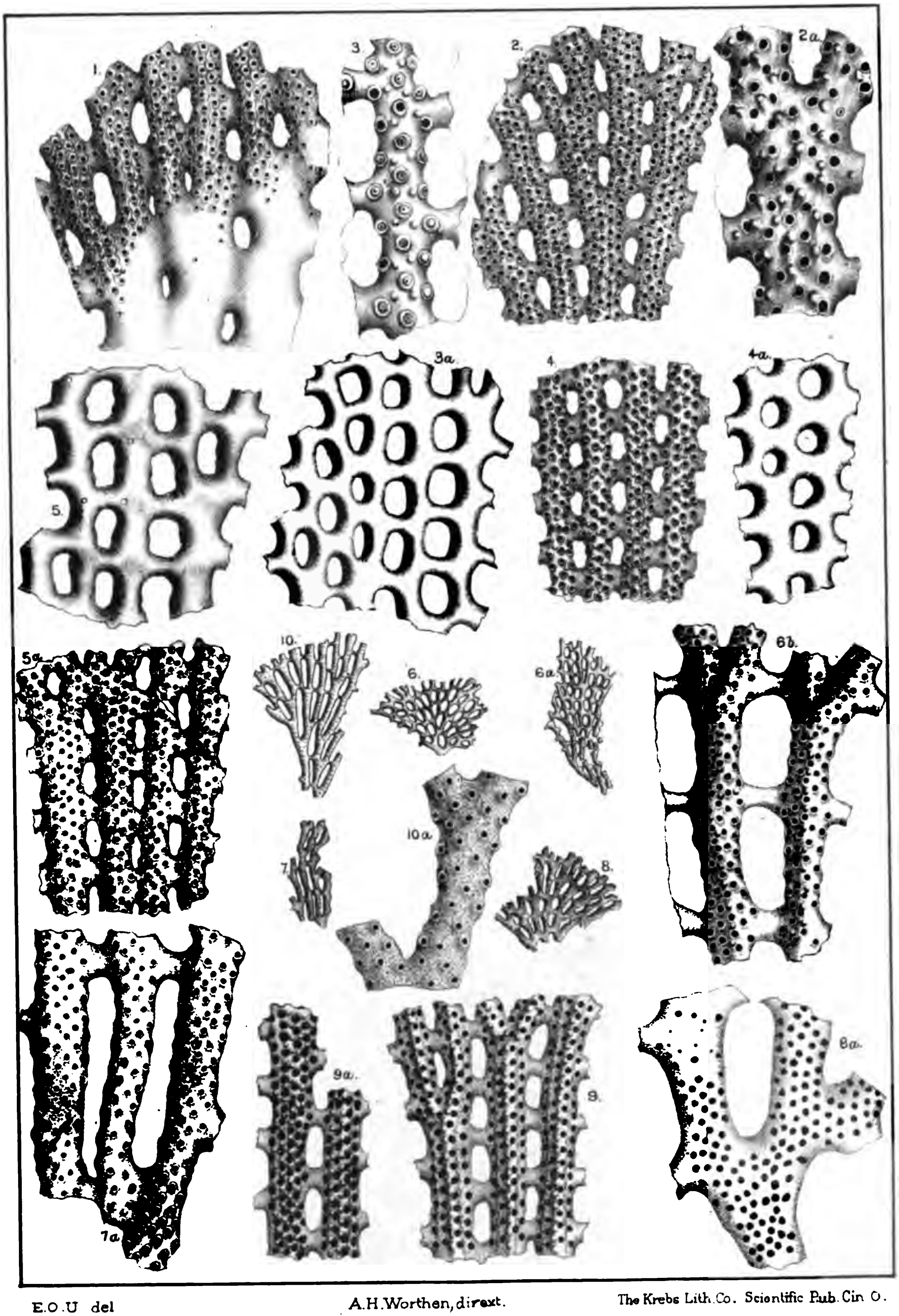

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PLATE LXII.

PAGE.

Fig. 1. **Polypora whitei var. insculpta** Ulr. 600
1. Natural size view of a fragment of this species.
1 *a*. Surface of same, x9.
1 *b*. Branch, x18, to show the peculiar surface characters.
Upper Coal Measures, Springfield, Ill.
E. O. Ulrich's collection.

Fig. 2. **Polypora whitei** Ulr. 600
2. Obverse surface, x18, showing two and three ranges of zoœcia.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 3. **Chainodictyon laxum var. minor** Ulr. 640
3. Reverse aspect, natural size.
3 *a*. Portion of same, x7, showing the relative size of branches and fenestrules, and the curved transverse folds.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 4. **Thamniscus ramulosus** Ulr. 610
4. Two specimens of the natural size.
4 *a*. Obverse surface, x9, showing the thin dissepiments and the arrangement of the papilliform apertures.
4 *b*. Reverse of young example, x18, showing distinct longitudinal striæ.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 5. **Thamniscus sevillensis** Ulr.* (See also Pl. LV) 610
5. Natural size view of a nearly complete specimen.
5 *a*. Poriferous surface, x9, showing zoœcia apertures in different states of preservation.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 6. **Thamniscus divaricans** Ulr. 608
6. Obverse side of an example without dissepiments. Natural size.
6 *a*. Surface of same, x9.
6 *b*. Obverse side of a fragment showing natural size, comparatively rigid branches, and remote dissepiments.
6 *c*. Reverse side of another specimen.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

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*Specimens, recently collected by the author at Seville, show this form to be sufficiently distinct from *T. ramulosus* to entitle it to specific rank.

Plate LXII—*Continued.*

PAGE.

Fig. 7. THAMNISCUS OCTONARIUS Ulr. 611
7. A perfect frond of the natural size.
7 *a*. Obverse side, x9, showing the arrangement and form of the zoœcia apertures.
7 *b*. Portion of same, x35, to show more clearly the form of the apertures, and other features.
Upper Coal Measures, Greenwood Co., Kansas.
Illinois State Museum.

Fig. 8. THAMNISCUS SCULPTILIS Ulr. 608
8. Reverse side of a fragment, x9.
8 *a*. Obverse side of a smaller specimen, x9.
8 *b*. Portion of same, x18.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 9. THAMNISCUS FURCILLATUS Ulr. 609
9. A specimen of the natural size.
Chester, Illinois.
Illinois State Museum.
9 *a*. Fragment of the natural size, x18, showing the usual appearance of the obverse face.
Kaskaskia, Ill.
E. O. Ulrich's collection.

Fig. 10. THAMNISCUS DUBIUS (Schlotheim) 606
10, 10 *a*. Two specimens of the natural size, both showing dissepiments.
Permian, Poesneck, Germany.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 11. DIPLOPORA BISERIALIS Ulr. 637
11. Two specimens, natural size, showing mode of branching.
11 *a*. Poriferous side, slightly oblique, x18.
11 *b*. Reverse aspect, x18, showing near the upper end the prominence of the peristomes.
11 *c*. Side view of an imperfect specimen, x18.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 12. DIPLOPORA BIFURCATA Ulr. 637
12. Three specimens, natural size.
12 *a*. One of them, x9.
Chester group, Chester, Ill.
Illinois State Museum.

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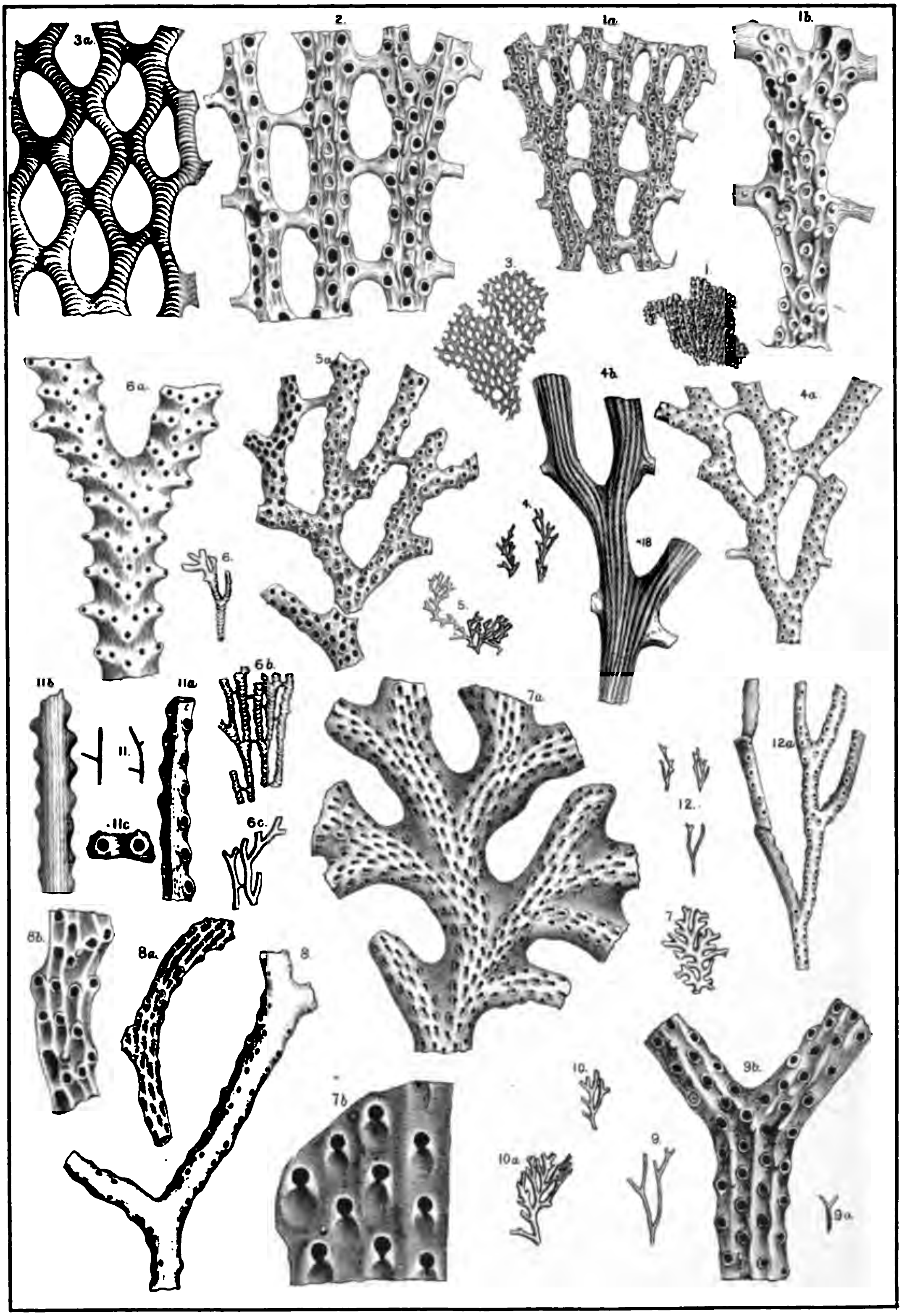

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PLATE LXIII.

PAGE

Fig. 1. **ARCHIMEDES COMMUNIS** Ulr........ 573

1. Specimen of the axis, showing the remarkable uniformity of the volutions. Natural size.

1 *a*, 1 b, 1 *c*. Three fragments of the natural size showing slight variations.

1 *d*. Two sections, natural size, one of a sinistrally, the other of a dextrally wound example showing the inner portion of fenestrated expansion.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 2. **ARCHIMEDES COMPACTUS** Ulr.. 572

2, 2 *a*, 2 *b*, 2 *d*. Four specimens of the sub-fusiform axis of this species, natural size, showing slight variations. The last is the youngest example seen.
2 and 2 *a*, Sloan's Valley, Ky.
E. O. Ulrich's collection.
2 *b* and 2 *d*, Chester, Ill.
Illinois State Museum.

2 *e*. Vertical section of axis, natural size.

Fig. 2 *c*. **ARCHIMEDES INTERMEDIUS** Ulr... 574

Vertical section of a strong axis, natural size, showing the outline and the sudden outward bend of the fenestrated expansion.
Chester group, Chester, Ill.

Fig. 3. **ARCHIMEDES PROUTANUS** Ulr 576

3, 3 *a*, 3 *b*. Three fragments of the axis of this species, natural size, showing slight variations in size and volutions.

3 *c*. Vertical section of the strongest axis seen, natural size.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 4. **ARCHIMEDES MEEKANUS** Hall.. 578

Three fragments of the axis of this species, showing natural size and extremes in thickness of shaft so far noticed.
Chester group, Chester, Ill.
Illinois State Museum.

Fig. 5. **ARCHIMEDES TEREBRIFORMIS** Ulr 575

5, 5 *a*, 5 *b*. Three fragments of the axis, natural size, showing variations due to age and wearing.
Sloan's Valley, Ky.
E. O. Ulrich's collection.

5 *c*. Another fragment of the natural size from Chester, Ill.
Illinois State Museum.

Plate LXIII—*Continued.*

PAGE.

Fig. 6. **ARCHIMEDES OWENANUS** Hall 570
6. Fragment of the axis showing usual form and size.
Keokuk, Iowa.
Illinois State Museum.
6 *a*. Strongest fragment seen, natural size.
Keokuk group, 3 miles n. e. of Quincy. Ill.
Illinois State Museum.
6 *b*. Vertical section of large axis, natural size.
6 *c*. Vertical section of slender axis, natural size, forming unusually long volutions.

Fig. 7. **ARCHIMEDES NEGLIGENS** Ulr.. 569
7. Axis of this species, natural size.
Keokuk, Iowa.
Illinois State Museum.
7 *a*. Vertical section of another example, natural size.

Fig. 8. **ARCHIMEDES WORTHENI** Hall 571
8. Axis of this species, showing the usual peculiarities. Natural size.
8 *a*. Vertical section of portion of same, natural size.
Warsaw, Ill.
Illinois State Museum.

Fig. 9. **ARCHIMEDES DISTANS** Ulr. 578
9, 9 *a*. Two fragments of the axis of this species, natural size.
The first from Sloan's Valley, Ky., the second from Litchfield, Ky.
E. O. Ulrich's collection.
9 *b*. Specimen from Chester, Ill., showing the axis with much of the fenestrated expansion. At the lower edge of the latter a new axis is being formed, which, as is invariably the case, turns in the opposite direction.
Illinois State Museum.

Fig. 10. **ARCHIMEDES GRANDIS** Ulr. 569
Vertical section of a small specimen of this species, natural size.
Compare with figs. 6 *b* and 8 *a*.
Illinois State Museum.

Fig. 11, 11 *b*. **ARCHIMEDES PROUTANUS** var. 576
11. Specimen with much of the fenestrated expansion. Natural size.
Chester, Ill.
Illinois State Museum.
11 *b*. Natural size view of axis from Sloan's Valley, Ky.
E. O. Ulrich's collection.
These two specimens differ from *A. proutanus*, chiefly, in forming longer volutions.

Fig. 11 *a*, 11 *c*, 11 *d*. **ARCHIMEDES INVAGINATUS** Ulr. 575
11 *a*. A strong axis of this species, natural size.
Chester, Ill.
Illinois State Museum.
11 *c*, 11 *d*. Vertical sections of two specimens showing extremes in volutions.

Plate LXIII—Continued

PAGE.

Fig. 12. ARCHIMEDES SWALLOVANUS Hall. 574
12. Large axis of this species but of the usual form. Natural size.
Chester, Ill.
Illinois State Museum.
12 *a*, 12 *b*. Two specimens of a form having the shaft straighter than usual.
12 *c*, 12 *d*. Two vertical sections.
Chester, Ill.
Illinois State Museum.

Fig. 13. ARCHIMEDES PERMINIMUS Ulr. 572
The small specimen shown on fig. 11, x6.
Chester, Ill.
Illinois State Museum.

Fig. 14. ARCHIMEDES SUBLAXUS Ulr. 579
The type specimen of this species, of the natural size, showing the lax volutions of two axes, one of them sinistral, the other dextral.
Chester, Ill.
Illinois State Museum.

Fig. 15. ARCHIMEDES LAXUS Hall 580
15. Fragment of the axis, showing nearly two complete volutions.
Litchfield, Ky.
E. O. Ulrich's collection.
The same specimen is the type of Prof. Claypole's *Helicopora archimediformis*.
15 *a*. Another fragment of this species from the same locality and collection.
Both natural zize.

} Archimedes {

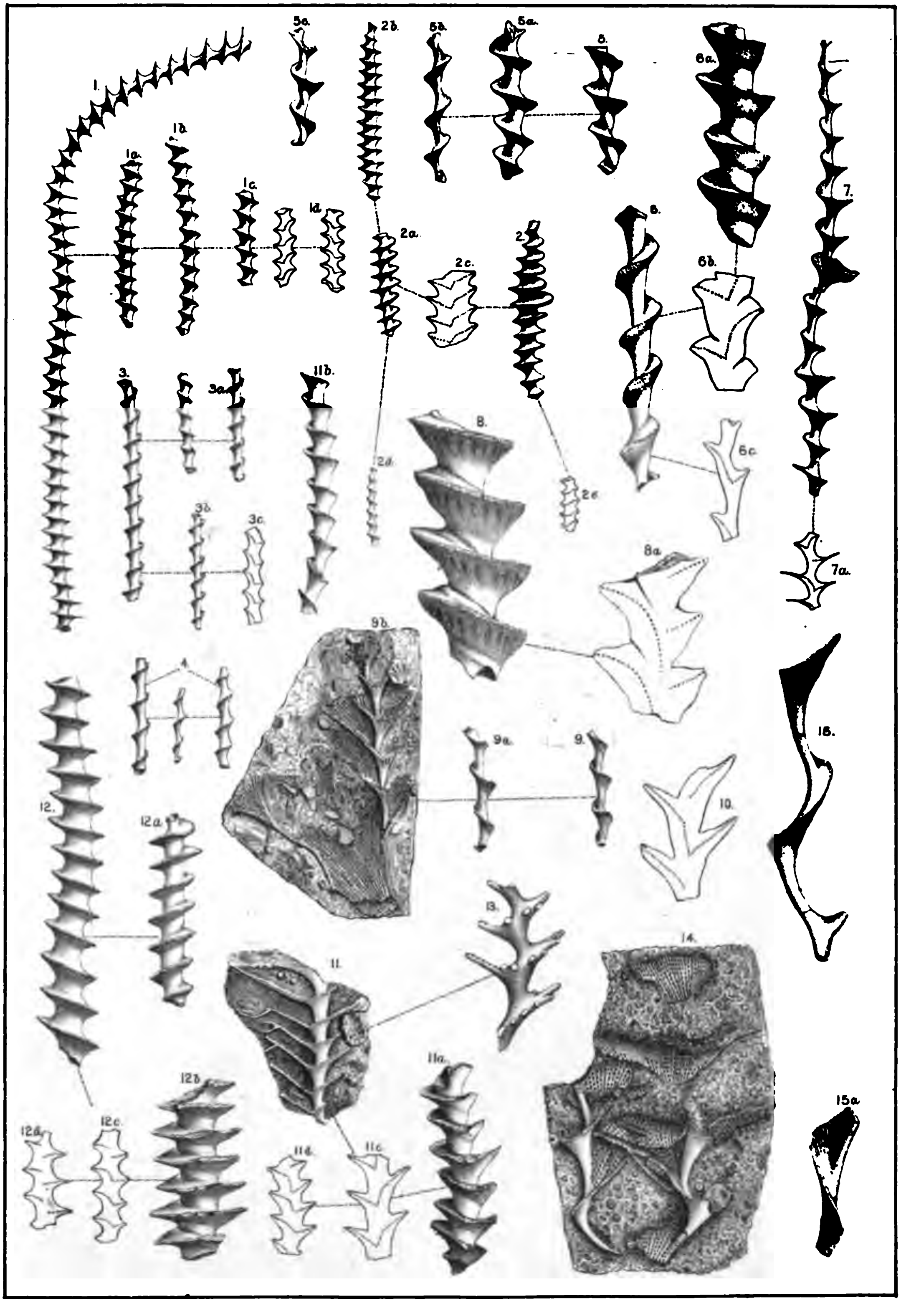

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PLATE LXIV.

PAGE.

Fig. 1. SEPTOPORA CESTRIENSIS Prout 628
1. Obverse face, x9, showing the rounded fenestrules and few zoœcia on the dissepiments.
1 *a*. Branch of same specimen, x18, showing accessory pores and some of the apertures closed with opercula-like plates.
1 *b*. Reverse face of another frond, x9.
Chester, Ill.
Illinois State Museum.

Fig. 2. SEPTOPORA SUBQUADRANS Ulr. (See also Pl. LVI) 629
2. Obverse face of a frond of this species, natural size.
2 *a*. Portion of same, x9, showing the old state slightly abraded.
2 *b*. Reverse of another frond, x9.
2 *c*. Obverse side of two branches, x9, showing a less mature condition than in fig. 2 *a*.
Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 3. SEPTOPORA ROBUSTA Ulr. (See also Pl. LVI) 633
3. Reverse aspect of a frond of this species, natural size.
Upper Coal Measures, Fayette, Co., Ill.
Illinois State Museum.
3 *a*. Surface of same, x9, showing the strong branches and numerous accessory pores.

Fig. 4. SEPTOPORA ROBUSTA var. INTERMEDIA Ulr. (See also Pl. LVI) 634
4. Obverse face of a frond, x9, showing the large zoœcia apertures.
4 *a*. Reverse side of another specimen, x9.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 5. SEPTOPORA DELICATULA Ulr 634
5. A frond of the natural size.
5 *a*. Portion of same, x9.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

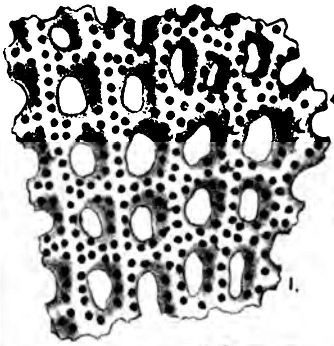
Plate LXIV—*Continued.*

PAGE.

Fig. 6. SEPTOPORA BISERIALIS var. NERVATA Ulr.. 632
A frond of the natural size, showing the stronger and thinner branches and the somewhat pinnate arrangement of the latter.
Upper Coal Measures, Montgomery Co., Ill.
Illinois State Museum.

Fig. 7. SEPTOPORA PINNATA Ulr. (See also Pl. LXV).. 633
The reverse aspect of a frond of this species, natural size.
Upper Coal Measures, Jasper Co., Ill.
Illinois State Museum.

[Acanthocladiidae.]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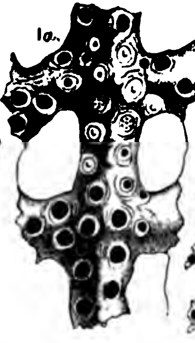
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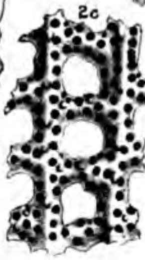
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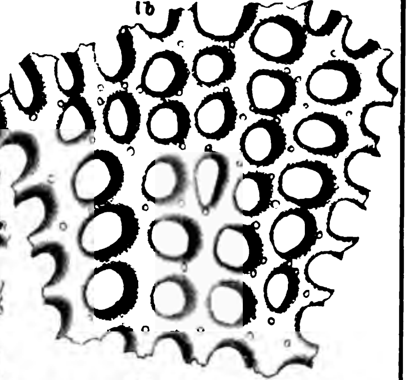
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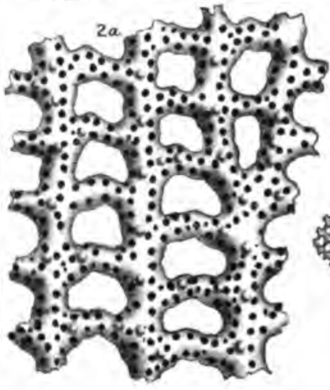
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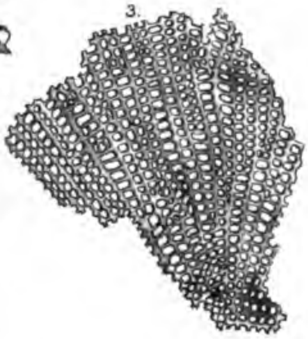
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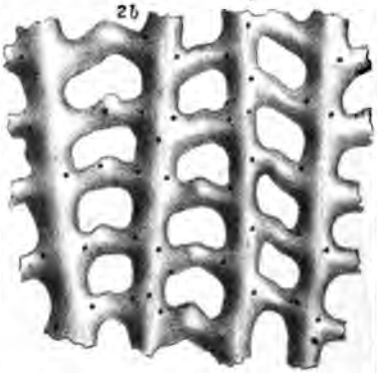
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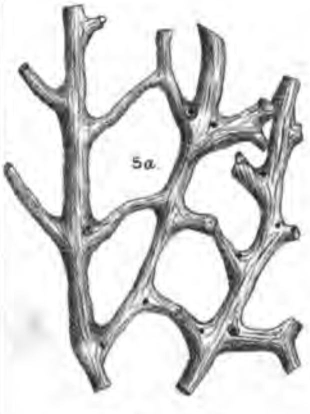
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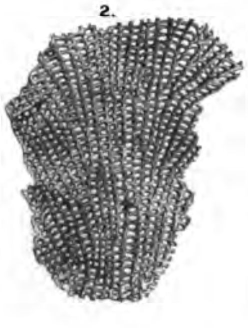
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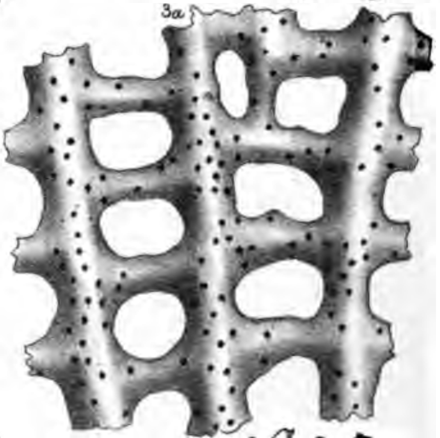
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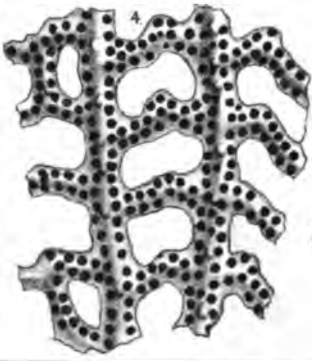
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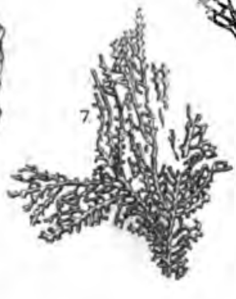
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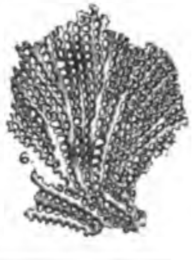
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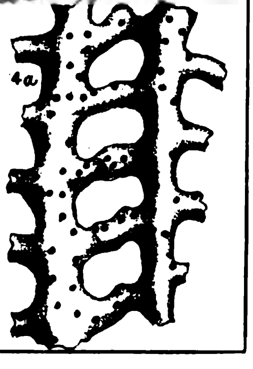
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PLATE LXV.

PAGE.

Fig. 1. SEPTOPORA PINNATA Ulr. (See also Pl. LXIV) 633
1. Obverse side of a branch and several pinnæ, x9, showing the arrangement of the zoœcia apertures and tubercles.
1 *a*. Portion of fig. 7, on Pl. LXIV, x9, showing the characters of the reverse.

Fig. 2. ACANTHOCLADIA FRUTICOSA Ulr 635
2. Obverse side of a frond, natural size.
2 *a*. Reverse side of several fronds belonging to the same zoarium as fig. 2.
2 *b*. Portion of fig. 2, x9, showing the arrangement of the zoœcia and the accessory pores.
2 *c*. Portion of fig. 2 *a*, x9, showing the fine striæ and submarginal row of accessory pores.
Upper Coal Measures, Springfield, Ill.
Illinois State Museum.

Fig. 3. PTILOPORA PROUTI Hall 625
3. Obverse face of a small frond, natural size.
3 *a*. Reverse side of another example, natural size.
3 *b*, 3 *c*. Portions of the two faces of 3 *a*, x9. The bifurcation of a branch so near the midrib is an unusual feature.
Warsaw beds, Monroe Co., Ill.
Illinois State Museum.

Fig. 4. PTILOPORA ACUTA Ulr 622
4. Portion of a frond, natural size, showing the acute angle at which the branches are given off from the midrib.
4 *a*. Obverse face of same, x9,
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Fig. 5. PTILOPORA VALIDA Ulr 623
5. Reverse side of a frond, natural size, showing the full length of the branches. Enlarged on Pl. LXVI.
5 *a*. Obverse face of midrib, with several branches, of the natural size. The same is magnified on Pl. LXVI.
5 *b*. Midrib with large branch, natural size, showing the appearance of the zoarium, when, as is usually the case, the lateral branches are broken away.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Plate LXV—*Continued.*

PAGE.

Fig. 5 *c*. PTILOPORA sp.

The basal part of a strong midrib that appears to be bifurcate. Investigation shows that this is not so. The branches had been broken away during life, as the cicatrices are in most places covered with a thick deposit of calcareous material. The little fragment of net-work remaining on the left side shows thick dissepiments and somewhat flexuous branches, two features in which it agrees with *P. acuta*. The acute angle at which the branches arise also point to that species.
Illinois State Museum.

Fig. 6. SPHRAGIOPORA PARASITICA Ulr. 638

6. Two specimens attached to the shell of *Athyris subtilita* Hall, x18. They represent at the same time the largest and the smallest seen.

6 *a*. Specimen of the average size, x18, growing upon the support of *Lyropora subquadrans* Hall. It shows the usual appearance of the Chester form.
Chester, Ill.
E. O. Ulrich's collection.

(Acanthocladiidae.)

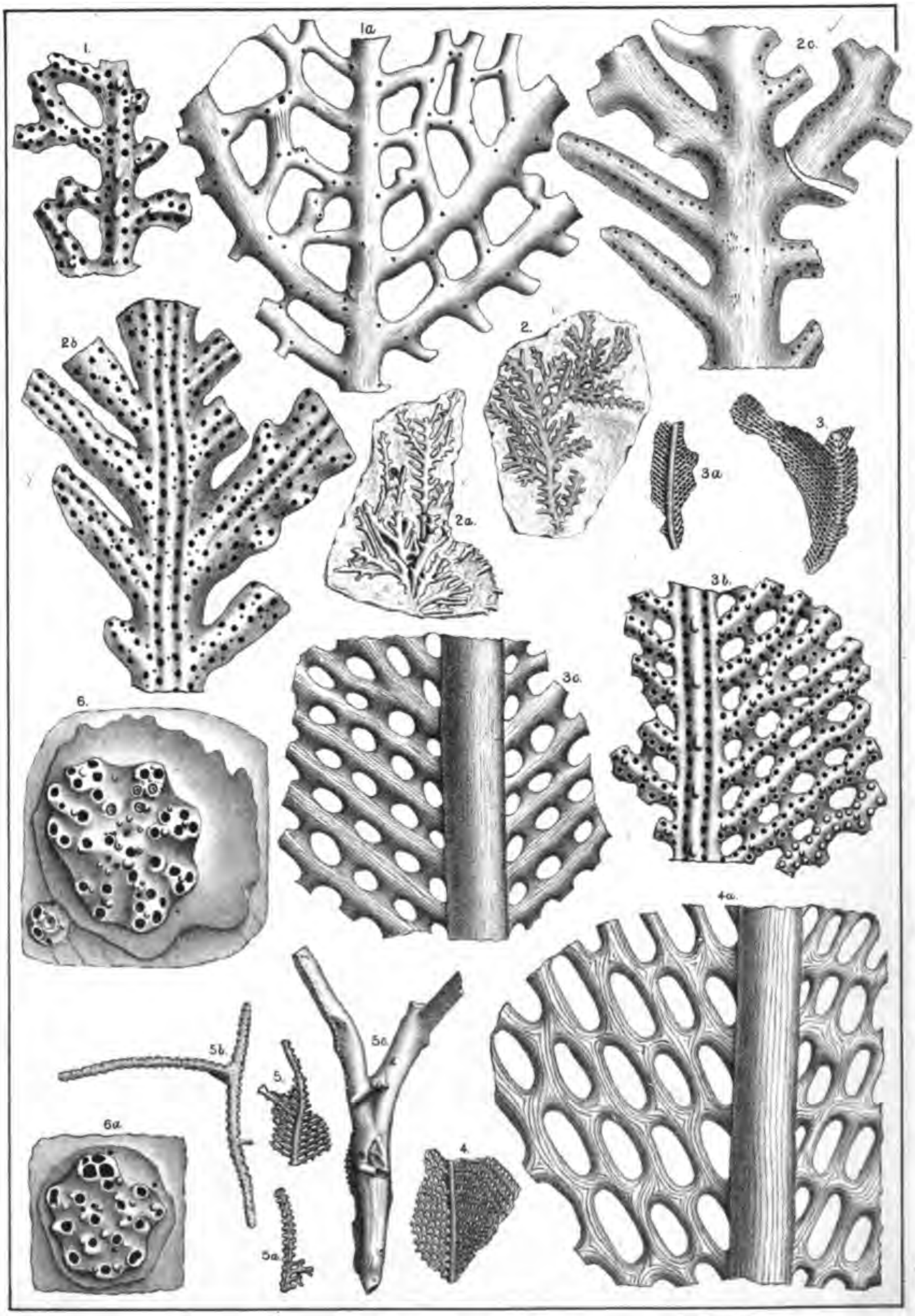

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PLATE LXVI.

PAGE

Fig. 1. PTILOPORA VALIDA Ulr. (See also Pl. LXV.) 623

1. Reverse, x9, showing full length of branches on the left side.
1 *a*. Obverse side of a specimen preserving a small number of branches, x9. The zoœcia apertures on the midrib are covered by a calcareous deposit.
1 *b*. Upper portion of same fragment, x9.

Fig. 2. PTILOPORA CYLINDRACEA Ulr 623

2. Obverse side of an example that preserves some of the branches, natural size, and x9. The magnified view shows the perfect condition. On old examples the rounded ridge of the midrib is less distinct.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.
2 *a*. Reverse of an example from Bentonsport, Iowa, x9.
Illinois State Museum.
2 *b*. Side view of midrib of fig. 2, x9.

Fig. 3. PINNATOPORA YOUNGI Ulr 615

Natural size, and portion x18.
King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 4. PINNATOPORA FLEXUOSA Ulr 617

4. A fragment of the natural size, with a portion, x18, showing the characters of the obverse face.
4 *a*, Small fragment showing the striated reverse side, with the accessory pores, and, where abraded, the uniserial arrangement of the zoœcia in the pinnæ.
4 *b*, 4 *c*. Two fragments of the natural size.
King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 4 *d*. PINNATOPORA STRIATA Ulr 617

A specimen of the natural size. This was at first supposed to be the same as *P. flexuosa*, but thin sections, prepared subsequently to the printing of the plates, prove it quite different.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Plate LXVI—*Continued.*

PAGE.

Fig. 5. Pinnatopora vinei Ulr 616
5. Natural size view of two fronds as they lay in the matrix.
5 *a*, 5 *b*. Obverse and reverse sides, x18.
King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 6. Pinnatopora conferta Ulr.. 618
A fragment of the natural size, with a portion, x9, showing the characters of the obverse face when slightly abraded.
Keokuk, Iowa.
E. O. Ulrich's collection.

Fig. 7. Pinnatopora tenuiramosa Ulr. 362, 619
Reverse side of the best specimen seen, showing the natural size and the unusually long delicate pinnæ.
Waverly group, Richfield, Ohio.
Illinois State Museum.

Fig. 8. Pinnatopora bellula Ulr 362, 619
8. Reverse side of a fragment, natural size, and x9.
8 *a*. Obverse side of another specimen, x18.
8 *b*. Portion of fig. 8, x18, to show the granulose character of the longitudinal striæ.
Lower Coal Measures, Seville, Ill.
Illinois State Museum.

Fig. 9. Septopora decipiens Ulr.. 630
9. Obverse side of branch of this species, natural size, and x9. On the latter the zoœcia apertures are drawn too small, and the small accessory pores, which had not then been detected, are not shown.
9 *a*. Obverse side of another fragment, doubtfully referred to this species. Natural size, and x9.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 10. Ptilopora paupera Ulr.. 624
Three specimens of the natural size, the central one doubtfully referred to this species.
King's Mountain, Ky.
E. O. Ulrich's collection.

VOL. VIII. GEOLOGICAL SURVEY OF ILLINOIS. PL. LXVI.

{Acanthocladiidae}

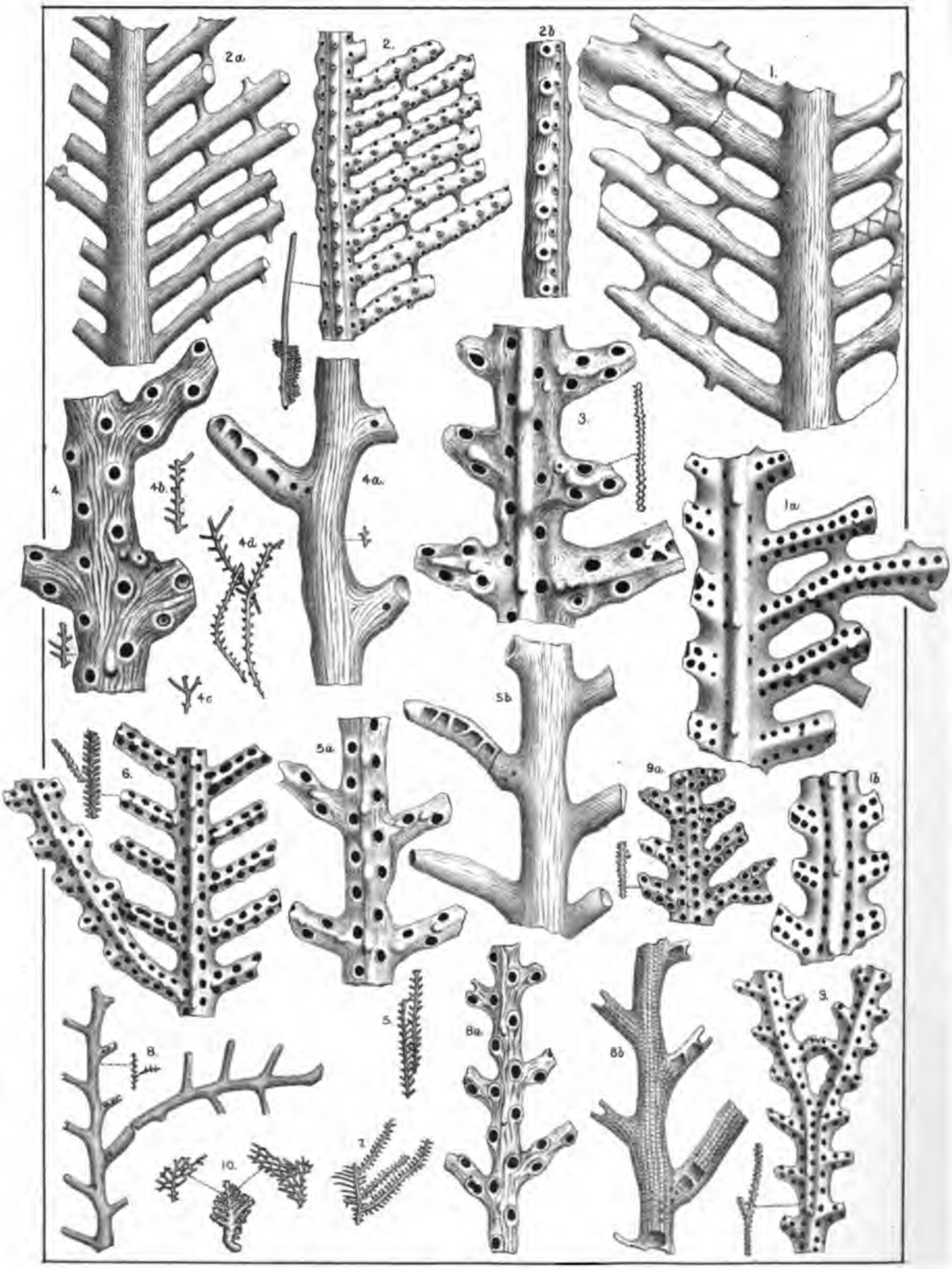

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PLATE LXVII.

PAGE

Fig. 1. TÆNIODICTYA RAMULOSA Ulr 528

1. Specimen split through center, showing natural size and mode of branching.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

1 *a* and 1 *f*. Two specimens, natural size, showing the spreading base.

1 *b*. Central portion of surface of 1 *a*, x18.

1 *c* and 1 *d*. Fragment of the natural size, and a portion x9.

1 *e*. Marginal portion of 1 *a*, x18.

1 *g*. Fragment, natural size.

1 *i*. Tangential section, x25, showing characters of frond just beneath the surface.

1 *j*. Portion of 1 *i*, x50.

1 *k*. Deep tangential section, x25, showing thin hemisepta crossing the zoœcia. A section since prepared shows that the minutely dotted structure shown in the walls also pertains to the median laminæ.

1 *l*. Vertical section, x25, showing form of zoœcia. In a better section, lately prepared, the inferior hemiseptum is well developed.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.

Fig. 2. TÆNIODICTYA RAMULOSA var. BURLINGTONENSIS Ulr 529

2. Specimen of the natural size. At the lower end the zoarium is twisted so that it appears to taper.

2 *a*. Surface of same, x18.

2 *b*. A reticulated example, referred with doubt to this variety. Natural size.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.

Fig. 3. TÆNIODICTYA CINGULATA Ulr 530

3. Specimen split through the center, showing natural size and mode of growth.
Keokuk limestone, Warsaw, Ill.
Illinois State Museum.

3 *a*. Tangential section x25, showing structure of frond just below the surface. The transversely lined region extends all around the zoœcia, differing in that respect from *T. ramulosa*, (see fig. 1 *i*.)

3 *b*. Portion of same section, x50, showing different form of zoœcia.

Plate LXVII—*Continued.*

PAGE.

Fig. 4. TÆNIODICTYA SUBRECTA Ulr 530

4 and 4 *a*. Specimen of this species, natural size, and portion x9.

4 *b*. The central ranges of zoœcia apertures, x18.

4 c. Casts of zoœcia, x18, showing strong constriction anteriorly due to the superior hemiseptum.

4 *d*. Casts of marginal zoœcia, x18.

St. Louis group, Elizabethtown, Ky.

E. O. Ulrich's collection.

Fig. 5. TÆNIODICTYA FRONDOSA Ulr. (See also Pl. LXIX.) 529

Fragment of the zoarium of this species, natural size.

Illinois State Museum.

(Low Carb Bryozoa.)

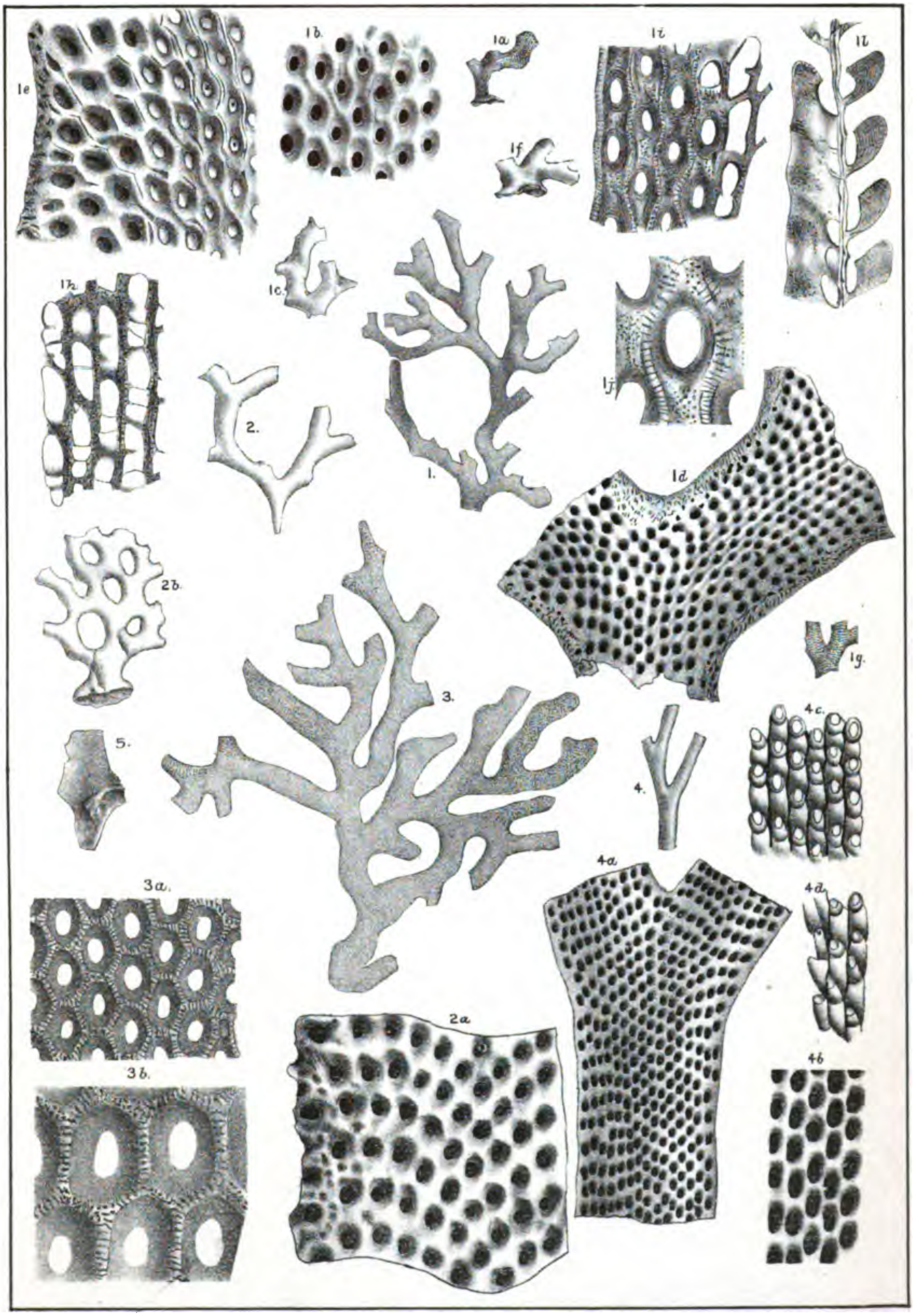

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PLATE LXVIII.

PAGE.

Fig. 1. WORTHENOPORA SPINOSA Ulr 669

1. Several branches, natural size, as they lay upon a slab.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

1 *a*. A very perfect fragment of the natural size.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

1 *b*. Portion of 1 *a*, x9, showing arrangement of zoœcia and the spinose margins.

1 *c*. Portion of same, x28.

1 *d*. Deep tangential section, x28.

1 *e*. Half of a transverse section, x28; taken from a young example.

1 *f*. Transverse section of an old example in which the exterior of the zoœcia is much thickened by laminated deposits, x28.

1 *g*. Vertical section. x28. This probably belongs to the next species.

Fig. 2. WORTHENOPORA SPATULATA Prout 670

2 and 2 *a*. Fragment of the natural size, and a portion, x28.
Warsaw beds, Warsaw, Ill.
E. O. Ulrich's collection.

Fig. 3. CYCLOPORA FUNGIA Prout 671

3. Surface of a specimen from Nauvoo, Ill., x9.
E. O. Ulrich's collection.

3 *a*. Portion of fig. 3, x18. This figure should be turned so that the right side is above. In this specimen the interspaces are oblong-quadrate.

3 *b*. Another portion of fig. 3. x18, showing part of one of the maculæ.

3 *c*. Tangential section, x28, showing structure and form of zoœcia at different levels, the lower portion being nearest the surface.
Warsaw beds, Warsaw, Ill.

3 *d* and 3 *e*. Two portions of another tangential section, x28 and 50, in which the walls are transversely lined and the interspaces of different form than in figs. 3 and 3 *a*.
Warsaw beds.

3 *f*. Vertical section, x28, showing the zoœcia of a specimen of medium thickness throughout their length.

3 *g*. Very small upper portion of a vertical section, x28, showing more numerous stages in the mesopores.

Plate LXVIII—*Continued.*

PAGE.

Fig. 4. CYCLOPORA EXPATIATA Ulr. 673
4. Tangential section, x28, showing the acanthopores and an irregular arrangement of the zoœcia and mesopores.
4 *a*. Several zoœcia of a tangential section, x50, arranged as in *C. fungia.*
4 *b*. Tangential section, x28, embracing one of the maculæ.
4 *c*. Portion of fig. 4, x50.
4 *d*, A zoœcium with inflected walls, x50.
Warsaw beds, Warsaw, Ill.
E. O. Ulrich's collection.

Fig. 5. STICTOPORELLA? BASALIS Ulr. (See also Pl. LXIX and LXXV) 582
5 and 5 *a*. Two portions of a tangential section, x50, showing structure of zoarium just beneath the surface.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

Low Carb. Bryozoa

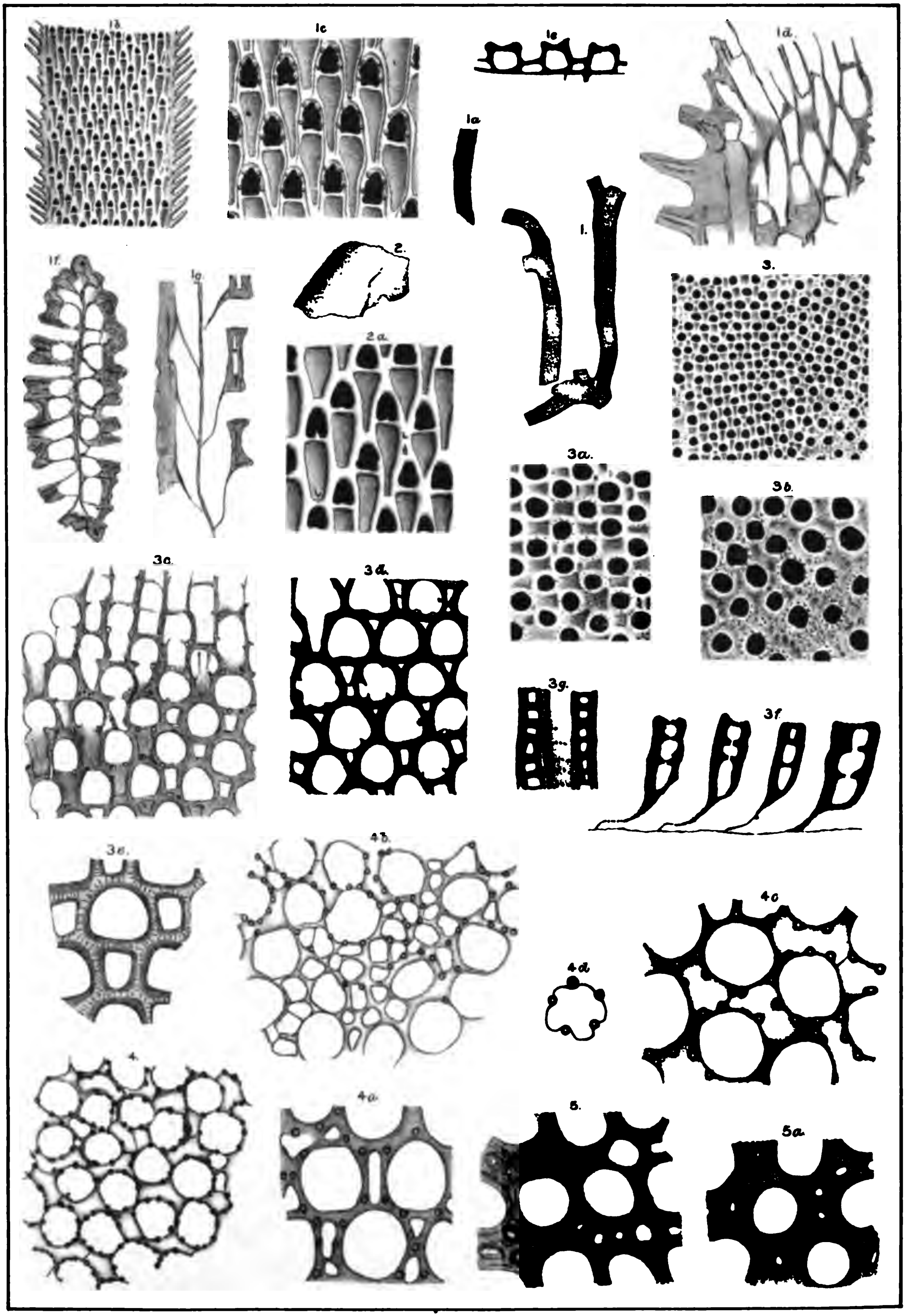

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PLATE LXIX.

PAGE.

Fig. 1. **Cyclopobella spinifera** Ulr. 675

1. Under surface of a specimen, natural size,
   Keokuk group, Warsaw, Illinois.
   Illinois State Museum.

1 *a* and 1 *b*. Two portions of a tangential section, x28, one with a macula. The hemisepta which may be seen in nearly all the zoœcia cavities are not represented. The acanthopores are also not distinct enough. They are nearly as conspicuous at this magnification as in fig. 3 *a*.

1 *c*. Portions of two vertical sections, x18, showing the strong acanthopores and superior hemisepta.

Fig. 2. **Stictoporella? basalis** Ulr. (See also Pl. LXVIII, and LXXV) 532

2. The erect portion of a zoarium split through the center so as to expose the surface of the median lamina; natural size.
   Keokuk limestone, Warsaw, Ill.
   Illinois State Museum.

2 *a*. Vertical section of same, x18. The lower portion of the tubular zoœcia is incorrectly drawn. (See plate LXXV.)

Fig. 3. **Cycloporella? perversa** Ulr. 676

3. Tangential section, x18, showing the usual appearance.

3 *a*. Portion of same, x50. The acanthopores are more numerous and stronger than usual.

3 *b*. Vertical section of a parasitic example, x18. The transversely lined body entering the section from the right represents one of the projecting surface lamellæ of the lamellibranch shell upon which it grew.

Fig. 4. **Proutella discoidea** Prout 674

4. The under side of a specimen, natural size.
   Keokuk group, Warsaw, Ill.
   Illinois State Museum.

4 *a*. Upper side of a fragment, natural size. The cell apertures should have been drawn in diagonally intersecting rows.
   Nauvoo, Ill.
   E. O. Ulrich's collection.

4 *b*. Surface of 4 *a*, x9, showing usual arrangement of cells.

4 *c*. Portion of same, x18. The thin cell front and the true orifice, are not shown, having first been discovered, after the plates were printed.

4 *d*. Thin section, x28. The anteriorly perforated diaphragms, which are dimly shown in this section, are not represented in the drawing.

Plate LXIX—*Continued.*

PAGE.

Fig. 5. TÆNIODICTYA FRONDOSA Ulr. (See also Pl. LXVII)............................... 529

5. Nearly complete frond, with large expanded base, showing natural size and irregular distribution of faint monticules.
Keokuk, Iowa.
E. O. Ulrich's collection.

5 *a*. Surface of same, x9, showing the usual appearance.

5 *b*. Several cells of same, x28, where the interspaces appear unworn.

5 *c*. Tangential section, x 28, showing the peculiar structure of the walls near the surface.

Fig. 6. STICTOPORELLA? UNDULATA Ulr.. 538

6. Incomplete frond of this species, natural size.
Chester group, Litchfield, Ky.
E. O. Ulrich's collection.

6 *a*. Surface of same, x9, showing arrangement of zoœcia apertures.

6 *b*. Small portion of surface, x28, showing sloping area around the apertures of both zoœcia and mesopores.

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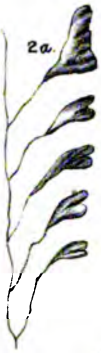
GEOLOGICAL SURVEY OF ILLINOIS.

PL. LXIX.

(Low. Carb. Bryozoa.)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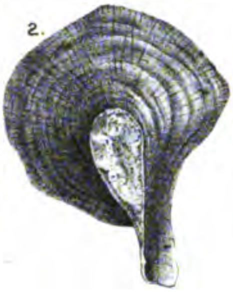
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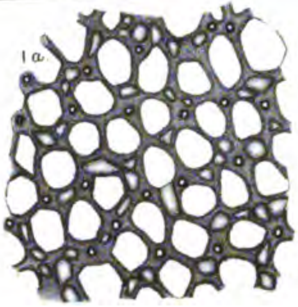
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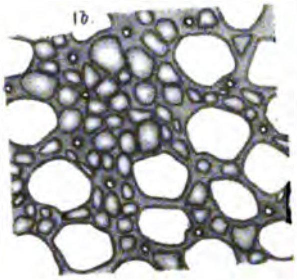
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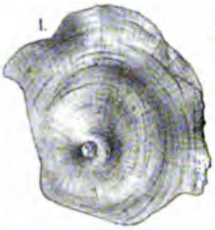
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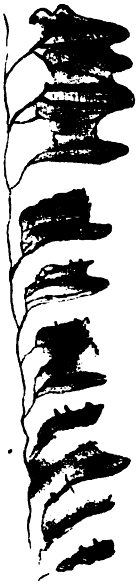
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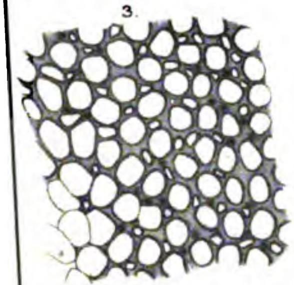
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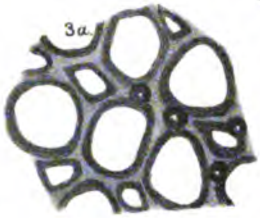
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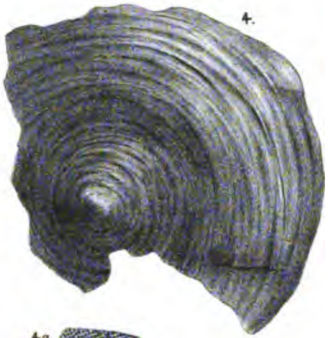
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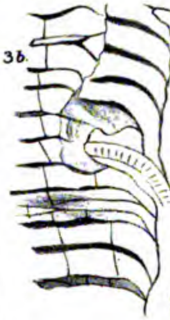
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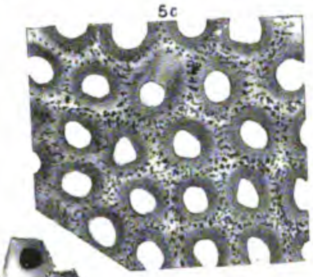
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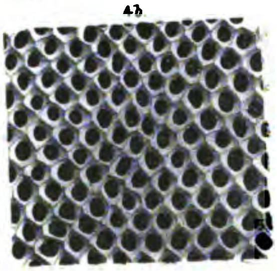
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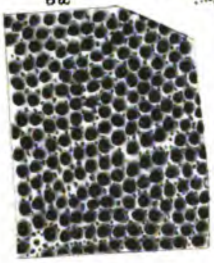
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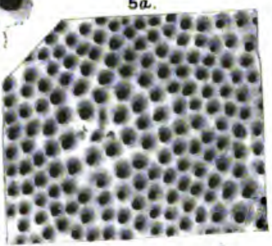
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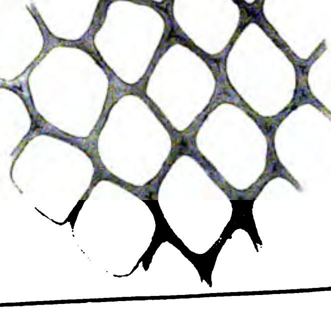
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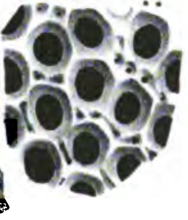
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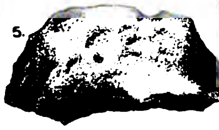
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PLATE LXX.

PAGE.

Fig. 1. **Rhombopora nicklesi** Ulr. 661

1. Fragment of the natural size and x12.
1 *a*. Portion of another example, x12.
1 *b*. A very slender branched fragment, x12. The enlargement of these three fragments is not sufficient to permit of representing the row of minute granules on each side of the summit of the interspaces.
1 *c*. Two fragments of medium size.
Upper Coal Measures, Sparta, Ill.
E. O. Ulrich's collection.

Fig. 2. **Rhombopora tabulata** Ulr. 658

2 and 2 *a*. Two fragments, showing natural size and mode of branching.
Chester group, Kaskaskia, Ill.
The first belongs to the Illinois State Museum, the other to E. O. Ulrich's collection.
2 *b*. Surface of 2 *a*, x12, Showing the usual appearances.
2 *c*. Vertical section, x18, showing the diaphragms in the axial region and other peculiarities of the species.

Fig. 3. **Rhombopora persimilis**? Ulr. 659

Fragment of the natural size and x12, slightly abraded. This specimen is stronger than usual, and is referred to the species with some doubt.
Chester, Ill.
E. O. Ulrich's collection.

Fig. 4. **Rhombopora minor** Ulr. 659

4. Three fragments of the natural size, with parts of two of them x12. The one to the right is the strongest seen, the others of medium size.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.
4 *a*. Vertical section, x18.

Fig. 5. **Acanthoclema confluens** Ulr. 662

5. Flattened example of the natural size.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.
5 *a* and 5 *b*. Surface of same, x12 and 24, showing an arrangement of zoœcia apertures and nodes between the flexuous ridges.

Plate LXX—*Continued.*

PAGE.

Fig. 6. RHOMBOPORA ANGUSTATA Ulr. . . . . 6[illegible]2
6. Fragment of the natural size, and a portion x12.
6 *a*. Another portion of same, x12.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 7. RHOMBOPORA ATTENUATA Ulr. 655
Two examples showing natural size, and a portion of one, x12.
Keokuk group, Warsaw, Ill.
E. O. Ulrich's collection.

Fig. 8. RHOMBOPORA TENUIRAMA Ulr. 660
8 and 8 *a*. Fragment of the natural size, with portions x12 and 24.
8 *b*. Branching fragment, natural size, and x24.
Chester group, Kaskaskia, Ill.
E. O. Ulrich's collection.

Fig. 9. RHOMBOPORA? ASPERULA Ulr. 656
9 and 9 *a*. Well preserved slender fragment of the natural size, with a portion x12.
Keokuk group, Nauvoo, Ill.
E. O. Ulrich's collection.
9 *b* and 9 *c*. A stronger example, in the ordinary state of preservation, natural size, and a part of the surface x12.
Keokuk, Iowa.
E. O. Ulrich's collection.
9 *d* and 9 *e*. Portions of two tangential sections, x18, showing the irregular arrangement of zoœcia and acanthopores.

Fig. 10. RHOMBOPORA EXIGUA Ulr. 651
10 and 10 *a*. An example of the natural size, with two portions of the surface x12.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.

Fig. 11. RHOMBOPORA GRACILIS Ulr. 651
11. Very complete example of the natural size.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.
11 *a*. Portion of the surface where the cells are irregularly arranged, x12.
11 *b*. Usual appearance of surface, x12.

Fig. 12. RHOMBOPORA INCRASSATA Ulr. 652
12 and 12 *a*. Two branching fragments, natural size.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.
12 *b*. Another fragment of the natural size, and x12. From the same locality.
12 *c*. Tangential section, x18.
12 *d*. Transverse section, x18.

Plate LXX—*Continued.*

PAGE.

Fig. 13. **Rhombopora dichotoma** Ulr. 650

13. Nearly entire example; natural size.
    Burlington limestone, Burlington, Iowa.
    Illinois State Museum.

13 *a*. Portion of surface just beneath the first bifurcation, x12.

13 *b*. Portion of surface between the third and fourth bifurcations, x12.

Fig. 14. **Bactropora simplex** Ulr. (See also Pl. LXXI) 663

14. Two complete examples, natural size.
    Keokuk Group, Warsaw, Ill.
    E. O. Ulrich's collection.

14 *a*. Small slab with a number of specimens; natural size.
    Keokuk group, Nauvoo, Ill.
    E. O. Ulrich's collection.

14 *b*. Surface of well preserved example, x12.

Rhombopora.

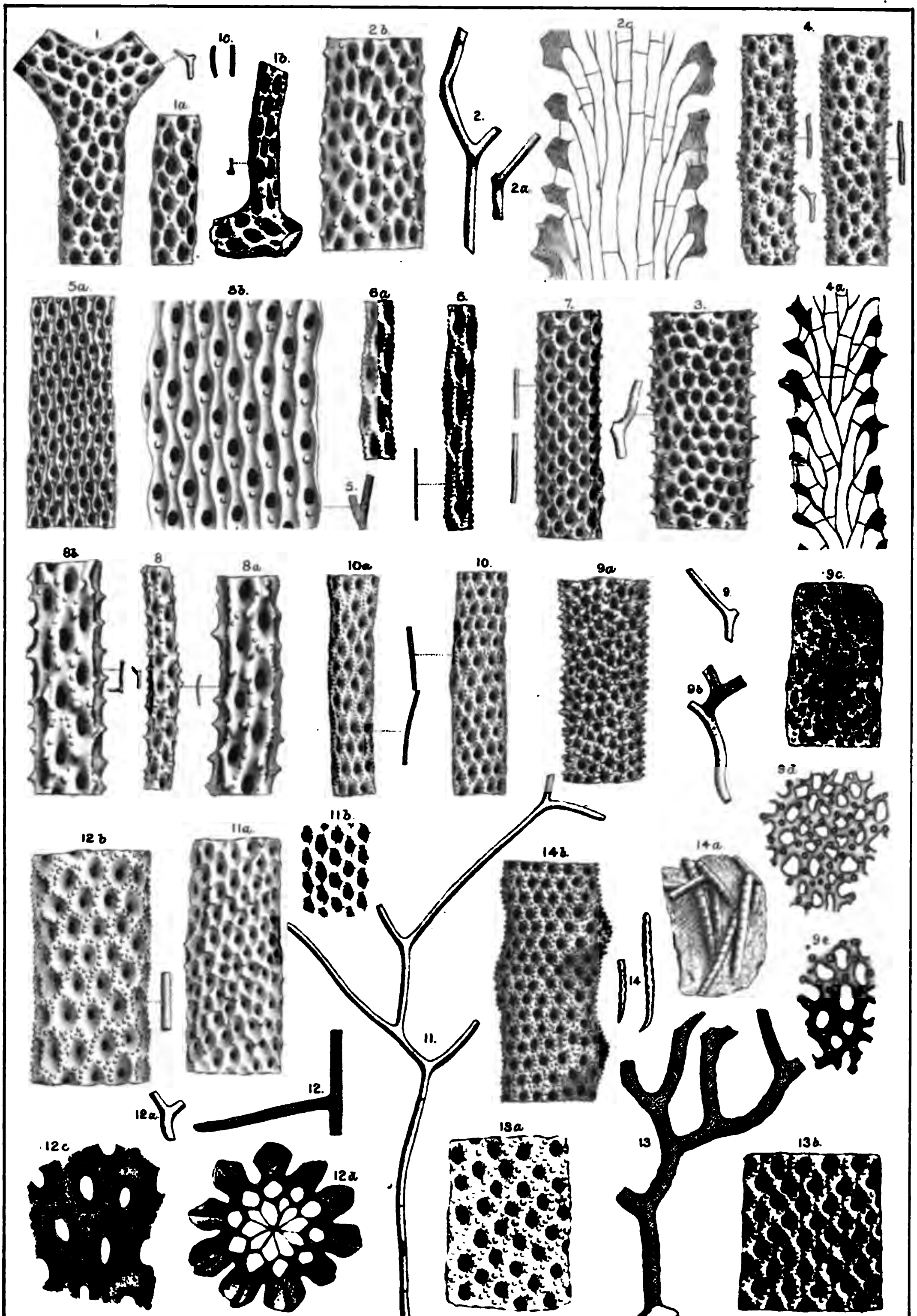

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PLATE LXXI.

PAGE

Fig. 1. **RHOMBOPORA VARIANS** Ulr. ... 653

1. Strong example of the natural size.
   Keokuk group, Warsaw, Ill.
   Illinois State Museum.

1 *a*. Surface of same. x12, showing the appearance about midway between the base and the first bifurcation.

1 *b*. About the same region on fig. 1*c*, x12.

1 *c*. A small example from near Plymouth, Ill.
   Illinois State Museum.

1 *d*. Upper end of fig. 1*c*, x12.

1 *e*. Tangential section of old example, x18, showing structure at different levels.

1 *f*. Half of a vertical section, x18.

Fig. 2. **RHOMBOPORA SIMULATRIX** Ulr. ... 657

2. Rather small example, natural size, and a portion x12.

2 *a*. The smallest specimen seen, natural size.

2 *b*. Rather strong fragment, natural size.
   St. Louis group, Columbia, Ill.
   E. O. Ulrich's collection.

2 *c*. Strongest specimen seen, natural size.
   Monroe Co., Ill.
   Illinois State Museum.

2 *d*. Tangential section, x18.

2 *e*. A little more than half of a vertical section, x18, showing several hemisepta.

Fig. 3. **RHOMBOPORA DECIPIENS** Ulr. ... 657

3 and 3*a*. Three specimens showing variations in size and mode of branching, natural size.
   St. Louis group, Monroe Co., Ill.
   Illinois State Museum,

3 *b*. Surface of an example like fig. 3, x12.

3 *c*. About two-thirds of a vertical section, x18, showing superior hemisepta, and peculiarities in the development of the zoœcia.

3 *d*, Tangential section, x18, showing thicker walls than usual.

Plate LXXI—*Continued.*

PAGE.

Fig. 4. **Rhombopora transversalis** Ulr. 654
- 4. Fragment of the natural size, showing the transverse furrows as they appear in a fully matured example.
  Keokuk group, Warsaw, Ill.
  Illinois State Museum.
- 4 *a*. Surface of same, x12.
- 4 *b*. Tangential section, x18.

Fig. 5. **Rhombopora? spiralis** Ulr. 656
- 5. A fragment of this species, natural size, with two portions of its surface x12. The interspaces carry granules, which, when the surface is abraded, are represented by small pores.
- 5 *a*. Another fragment, x12. This is abraded and has the zoœcia apertures surrounded by one or two rows of small pores.
- 5. Small portion of a tangential section, x18, showing pores of various sizes in the walls.
- 5 *c*. Transverse section, x18, showing the spiral arrangement of the zoœcia about the center.
- 5 *d*. Vertical section, x18. Sections of this kind closely resemble those of *Streblotrypa major*. The species may have to be referred to that genus.
  Keokuk group, King's Mountain, Ky.
  E. O. Ulrich's collection.

Fig. 6. **Bactropora simplex** Ulr. (See also Pl. LXX.) 663
- 6. Tangential section, x18, showing the peculiar stellate character of the acanthopores.
- 6 *a*. Small portion of a vertical section, x18.

Fig. 7. **Streblotrypa subspinosa** Ulr. 668
- 7. Two examples showing natural size and mode of branching.
- 7 *a*. Surface of one, x18.
  Chester group, Kaskaskia, Ill.
  Illinois State Museum.

Fig. 8. **Streblotrypa major** Ulr. (See also Pl. LXXII.) 666
- 8 and 8 *a*. Two fragments of the small form of this species.
  King's Mountain, Ky.
  E. O. Ulrich's collection.
- 8 *b*. Surface of fig. 8, x18.
- 8 *c*. Portion of a tangential section, x18.
- 8 *d*. Example of the large form, natural size.
  Keokuk group, Nauvoo, Ill.
  Illinois State Museum.

Plate LXXI—*Continued.*

PAGE

Fig. 9. **Streblotrypa nicklesi** Ulr.. 667

9 and 9 *a*. Three fragments of the natural size, and the surface of one, x18.

9 *b*, Tangential section, x50, showing structure and arrangement of mesopores.

9 *c*. Vertical section, x18, showing inferior hemisepta and very slender tubes in the axial region.

Chester group, Kaskaskia, Ill.
E. O. Ulrich's collection.

Fig. 10. **Streblotrypa distincta** Ulr 669

10. Fragment natural size, with a portion x18.

10 *a*. Portion of another fragment on which the transverse arrangement of the zooecia apertures prevails.

10 *b*. Two portions of tangential sections, x18.

Chester group, Chester, Ill.
Illinois State Museum.

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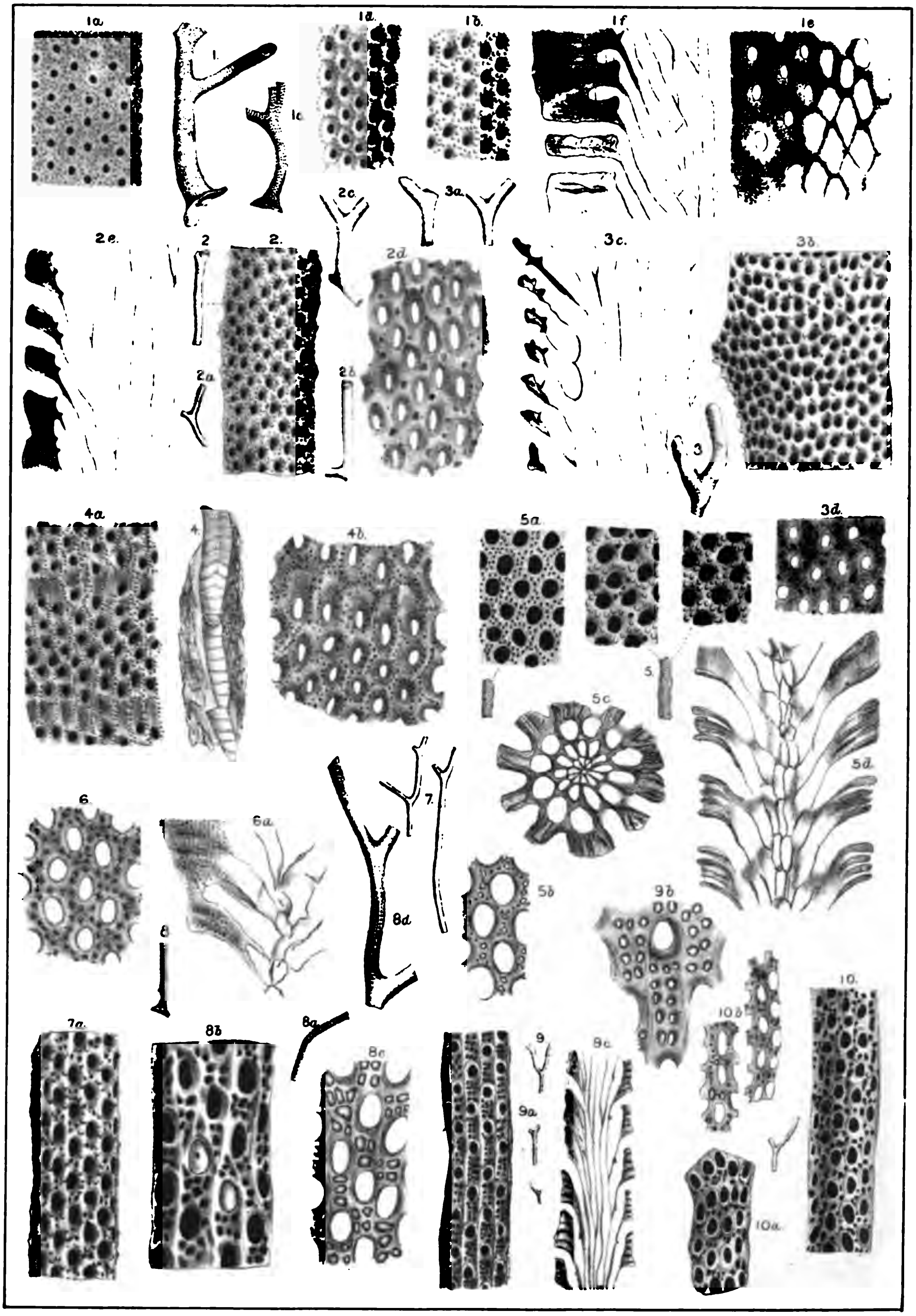

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PLATE LXXII.

PAGE.

Fig. 1. **STREBLOTRYPA MAJOR** Ulr. (See also Pl. LXXI.) 666

1. Transverse section, x18.

1 *a*. Vertical section of small example, x18. It divides the zoarium a little obliquely.

Fig. 2. **STREBLOTRYPA RADIALIS** Ulr. 667

2. Surface of a branch of the usual size and appearance, x12, showing the minute pores in the posterior half of the hexagonal sloping areas.

2 *a*. Tangential section, x28, showing structure just beneath the surface.

2 *b*. Vertical section, x28, showing the small inferior hemisepta and other features of the species.

2 *c*. Deep tangential section, x28. Along the middle of the figure, the strong transverse lines or denticles represent the hemisepta, the dimly shaded spaces, with which they alternate, the zooecia walls cut obliquely.
Keokuk group, near Nauvoo, Ill.
Illinois State Museum.

Fig. 3. **COELOCONUS GRANOSUS** Ulr 665

3. A complete but compressed specimen, natural size.
Chester group, near Anna, Ill.
Illinois State Museum.

3 *a*. Another, less complete, natural size and x12.

3 *b*. Vertical section, x18.

Fig. 4. **COELOCONUS RHOMBICUS** Ulr. 664

4. Two examples of the natural size, with the lower two-thirds of one x12.

4 *a*. Vertical section, x18, showing much thinner walls and epitheca than *C. granosus*.

4 *b*. Transverse section, x18.

4 *c*. Tangential section, x18.

Fig. 5. **ANISOTRYPA SYMMETRICA** Ulr. 448

An example of this species, natural size, showing arrangement of zooecia apertures and the isolated large cells.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Plate LXXII—*Continued.*

PAGE

Fig. 6. ANISOTRYPA FISTULOSA Ulr 448

6. A fragment of the usual size.
6 *a*. Another fragment broken so as to show the epitheca lining the inner side of the branches. Natural size.
St. Louis group, Pella, Iowa.
Illinois State Museum.
6 *b*. Vertical section, x18, showing the perforated diaphragms and other features of two layers, and a portion of a third.
6 *c*. Tangential section, x18, showing varying thickness of walls, and perforated diaphragms.

Fig. 7. ANISOTRYPA RAMULOSA Ulr 449

7 and 7*a*. Two examples of this species, natural size. The stems are solid but their surface and tangential sections are much like *A. fistulosa*.
St. Louis group, Pella, Iowa.
Illinois State Museum.

Fig. 8. STENOPORA RUDIS Ulr 444

8. An irregular hollow branch of this species, natural size, showing faint monticules and, at the upper end, the thickness of the zoarium.
8 *a*. Tangential section, x18, showing acanthopores, several perforated diaphragms, and variations in the thickness of the walls.
8 *b*. Vertical section, x18, showing two distinct layers of zoœcia tubes, their tabulation, and slightly moniliform characters of the walls.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 9. ANISOTRYPA SOLIDA Ulr 449

9 and 9 a. Two examples of the natural size.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.
9 *b*. Tangential section, x18. From a Sloan's Valley specimen.
9 *c*. Small portion of a tangential section, x50, showing structure of walls very clearly. From a Chester, Ill. example.
9 *d*. Vertical section, x18, from a Sloan's Valley specimen. In this the beaded structure of the walls in the peripheral region is more marked, than in fig. 9 *e*.
9 *e*. Vertical section of an old example from Chester, Ill., in which the walls are only very slightly moniliform.

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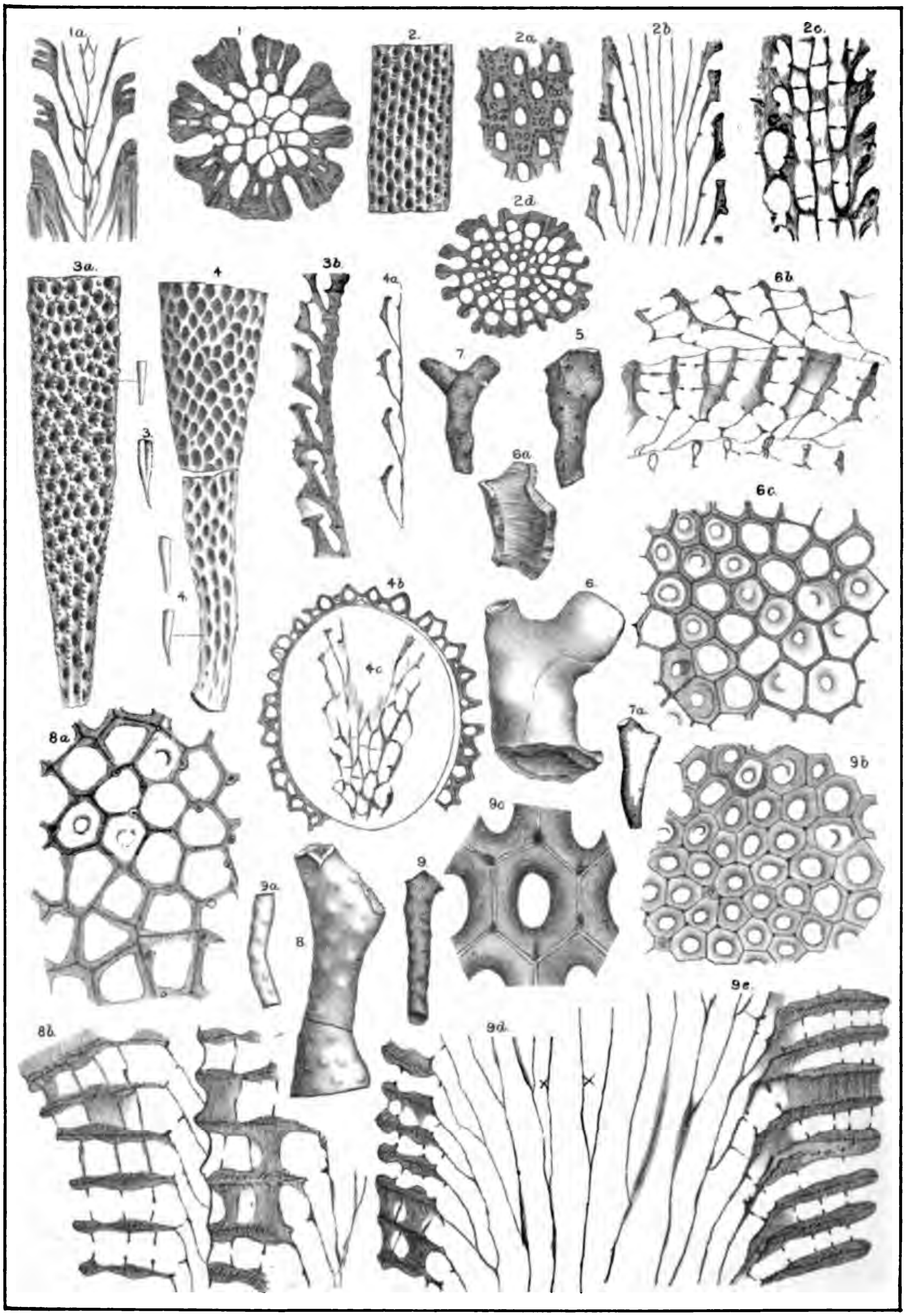

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PLATE LXXIII.

PAGE.

Fig. 1. **EVACTINOPORA QUINQUERADIATA** Ulr 510
View of the upper side of the base of a small example, natural size.
Burlington limestone, Burlington, Iowa.
E. O. Ulrich's collection,

Fig. 2. **EVACTINOPORA SEXRADIATA** Meek and Worthen 510
2, 2 *a* and 2 *b*. Three views of the strong base of an average example of this species, natural size.
Burlington limestone, Burlington, Iowa.
E. O. Ulrich's collection.

Fig. 3. **EVACTINOPORA RADIATA** Meek and Worthen 509
3 and 3 *a*. Basal and lateral views of an example that preserves several of the bifoliate rays entire. Natural size.
Keokuk gooup, King's Mountain Ky.
E. O. Ulrich's collection.

Fig. 4. **EVACTINOPORA GRANDIS** Meek and Worthen 511
A small example of this species appears upon the polished surface of the block of limestone in which it is imbedded. Natural size. The bifoliate rays are cut off about 4 cms. above the base.
Burlington limestone, Montezuma, Ill.
Illinois State Museum.

Fig. 5. **STENOPORA? SIGNATA** Ulr 446
5. Peripheral portion of a vertical section, x35, showing the peculiar structure of the walls, two mesopores, and an acanthopore.
5 *a*. Tangential section, x18.
5 *b*. Portion of 5 *a*, x35, showing minute dots about the zoœcia and acanthopores, and their arrangement in stellate clusters along the middle of the walls.
Upper Coal Measures, Caseyville, Ill.
Illinois State Museum.

Fig. 6. **STENOPORA RAMOSA** Ulr 442
6. Tangential section, x18, showing variations in thickness of walls due to their periodic swellings. Also perforated diaphragms, and the arrangement of the acanthopores.
6 *a*. Small portion of another tangential section, x50, showing minute foramina in the perforated diaphragms, and, in the walls, what may have been communication pores.

Plate LXXIII—*Continued.*

PAGE.

6 *b*. Peripheral portion of a zoœcia wall of a vertical section, x50. This section was prepared from the same specimen that furnished fig. 6 *a*. It shows the supposed communication pores, the laminated structure of the walls, and the thick margin of the opening in the diaphragms.

6 *c*. Vertical section, x18, showing arrangement of diaphragms in the comparatively narrow "mature" region.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Fig. 7. STENOPORA MEEKANA Ulr 443
7. Vertical section, x18.
7 *a*. Tangential section, x18.
Chester group, Chester, Ill.
Illinois State Museum.

Fig. 8. STENOPORA CARBONARIA (Worthen) 445
8. Tangential section, x18.
8 *a*. Three tubes of one vertical section, and one wall of another, x18, showing structure of walls in the typical form of the species.
Upper Coal Measures, Caseyville, Ill.
Illinois State Museum.

Fig. 9. STENOPORA CARBONARIA var. CONFERTA Ulr 445
9. Tangential section, x18, showing variations in wall structure, perforated diaphragms, and strong acanthopores.
9 *a*. Vertical section, x18, showing the close arrangement of the wall swellings.
Upper Coal Measures, Caseyville, Ill.
Illinois State Museum.

Fig. 10. STENOPORA CARBONARIA var. MACULOSA Ulr 445
10. Tangential section, x18, showing one of the maculæ, and the large zoœcia about it.
10 *a*. Peripheral portion of a vertical section, x18. Same locality and collection as preceding.

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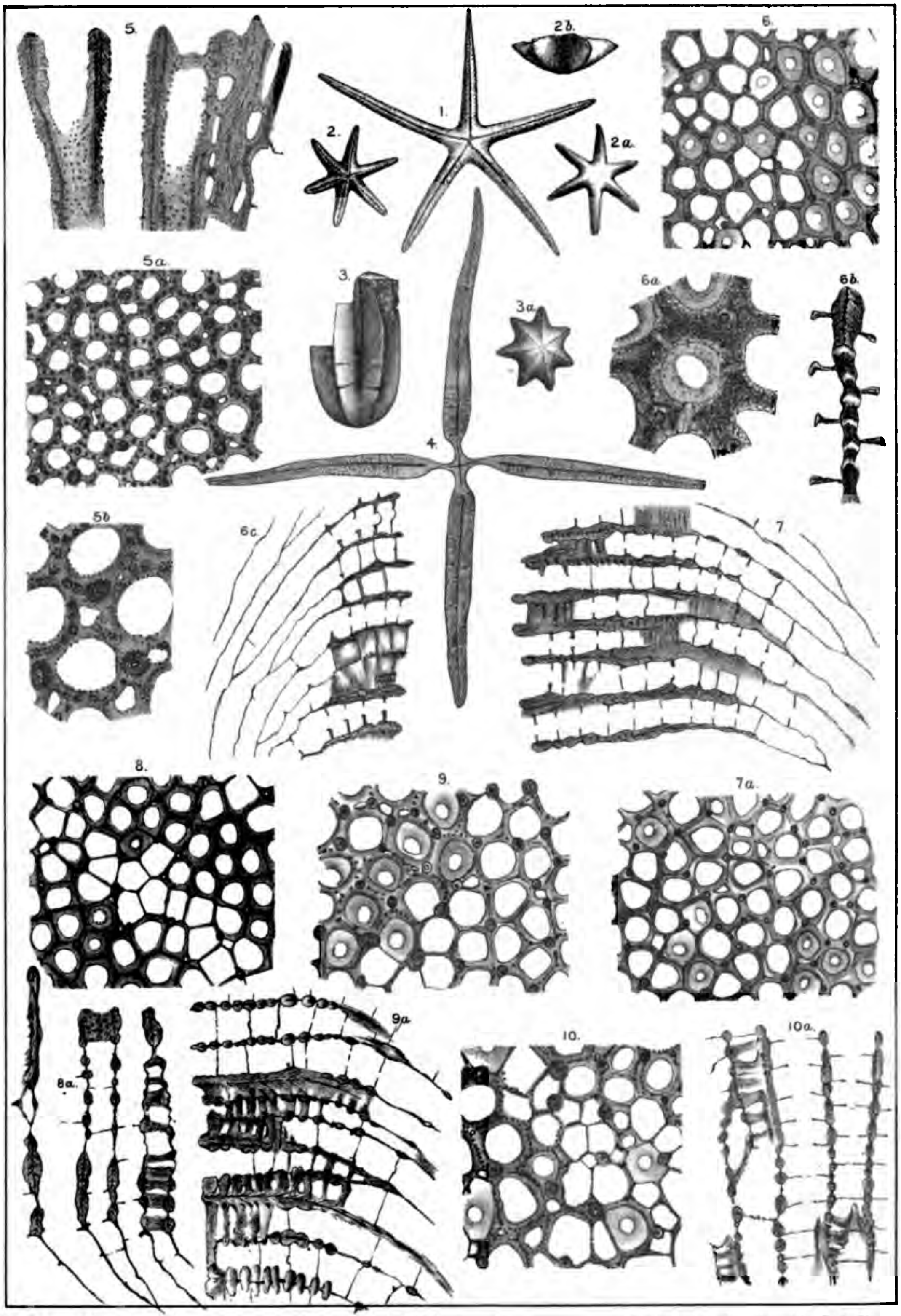

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PLATE LXXIV.

PAGE.

Fig. 1. STENOPORA AMERICANA Ulr. 437
1. Tangential section, x18, showing extremes of wall thickness.
1 *a*. Peripheral portion of a vertical section, x18, showing moniliform character of walls. To the left a wall from another section.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

Fig. 2. STENOPORA EMACIATA Ulr. 438
2. Tangential section, x18, showing extremes in thickness of walls and size of zoœcia.
2 *a*. Vertical section, x18, showing faintly moniliform character of walls.
Keokuk group, Warsaw, Ill.
E. O. Ulrich's collection.

Fig. 3. STENOPORA AMERICANA var. VARSOVIENSIS Ulr 437
3. Peripheral portion of a vertical section, x18. showing irregular structure of walls.
3 *a*. Tangential section, x18.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

Fig. 4. STENOPORA MONTIFERA Ulr. 438
4. Tangential section, x18, showing wall structure and extremes in thickness of walls.
4 *a*. Tangential section of explanate form.
4 *b*. Vertical section, x18, showing irregular moniliform character of walls.
Keokuk group, Otter Creek, Jersey Co., Ill.
Illinois State Museum.

Fig. 5. STENOPORA INTERCALARIS Ulr. 439
5. Tangential section, x18, showing the mesopores and other features of the species.
5 *a*. Vertical section, x18, showing the discontinuous mesopores and the extreme paucity of diaphragms.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

Plate LXXIV—*Continued.*

PAGE.

Fig. 6. STENOPORA ANGULARIS Ulr. 439

6. Tangential section, x18, showing the thin walls and large acanthopores.

6 *a*. Vertical section, x18, of a layer thicker than usual, showing thin walls and absence of diaphragms.

6 *b*. Another portion of same vertical section, x18, showing two layers of zoœcia.

Keokuk group, Lagrange, Mo.
Illinois State Museum.

Fig. 7. STENOPORA CESTRIENSIS Ulr. 442

7. Tangential section, x35, showing the comparatively large cavity of the Acanthopores.

7 *a*. Vertical section, x18.

Chester group, Chester Ill.
Illinois State Museum.

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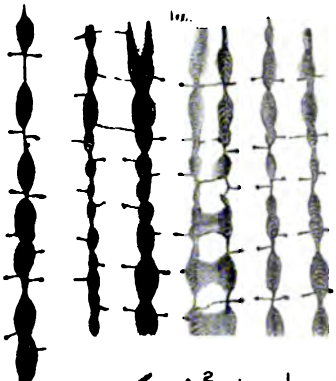
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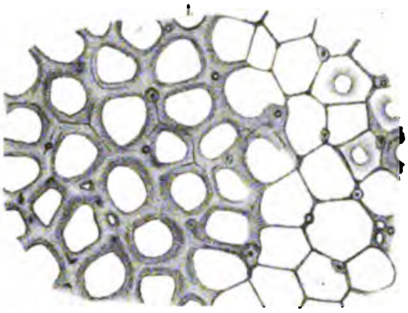
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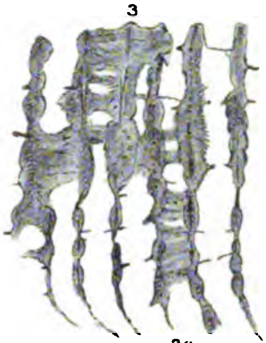
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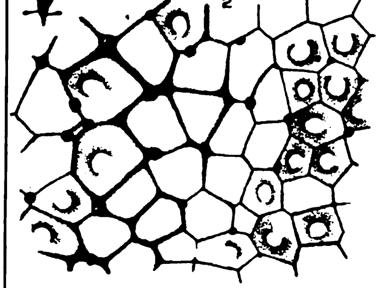
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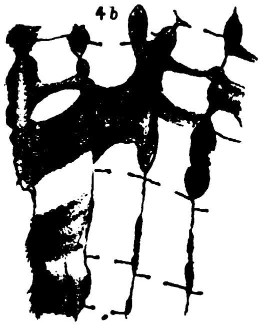
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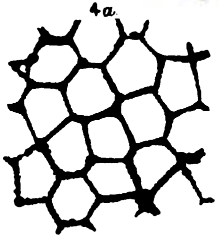
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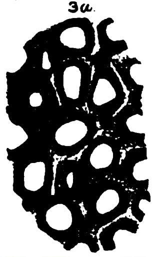
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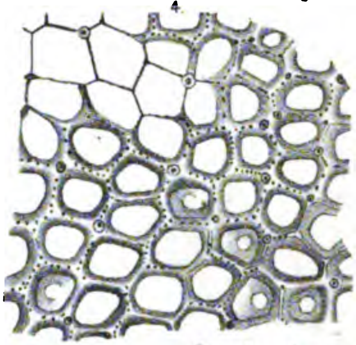
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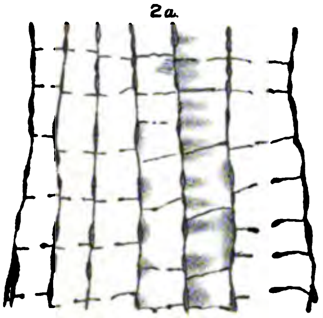
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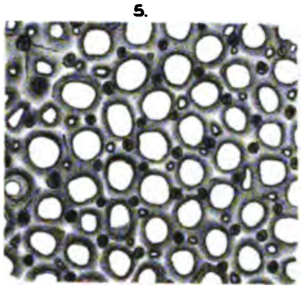
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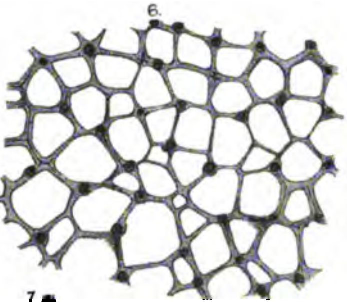
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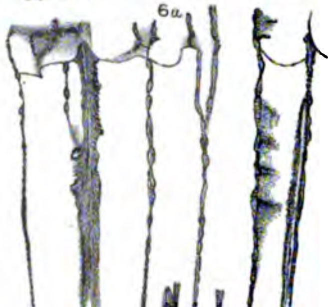
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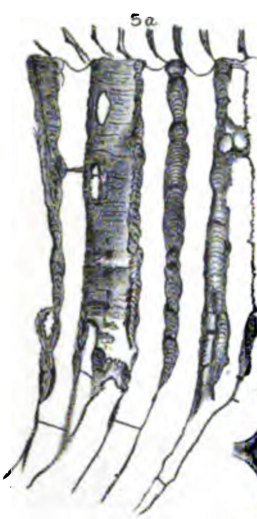
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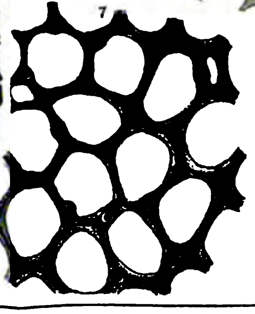
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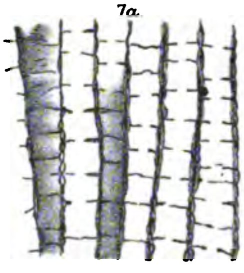
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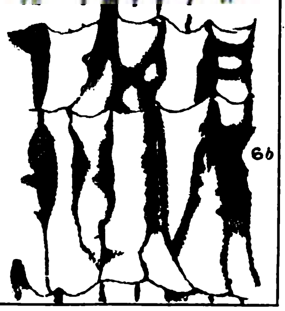
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PLATE LXXV.

PAGE.

Fig. 1. BATOSTOMELLA SPINULOSA Ulr. 434

1, 1 *a* and 1 *b*. Three specimens of the natural size.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

1 *c*. Surface x18, showing the sunken interspaces, mesopores, and abundant acanthopores.

1 *d*. Tangential section, x18, showing structure of peripheral region of zoarium.

1 *e* and 1 *f*. Two vertical sections, x18, one with, the other without diaphragms.

Fig. 2. BATOSTOMELLA ABRUPTA Ulr. 435

An example of this species, natural size.
Chester group, Sloan's Valley, Ky.
Illinois State Museum.

2 *a*. Another specimen, natural size, from the same locality.
E. O. Ulrich's collection.

2 *b*. Surface of fig. 2 *a*, slightly abraded, x18.

2 *c* and 2 *d*. Well preserved fragment, natural size, with small portion of surface, x18.
Sloan's Valley, Ky.
E. O. Ulrich's collection.

2 *e*. Half of a vertical section, x18, showing the abrupt thickening of the walls at the surface.

Fig. 3. BATOSTOMELLA NITIDULA Ulr. 436

3. Fragment of the natural size.
Chester, Ill.
Illinois State Museum.

3 *a*. Surface of same, x18. Over the lower half of the figure the zoœcia apertures preserve the perforated diaphragms.

3 *b*. Tangential section, x18, showing distribution of zoœcia, mesopores, and acanthopores.

Fig. 4. BATOSTOMELLA INTERSTINCTA Ulr. 434

4. Basal expansion with a number of branches broken away. Natural size.

4 *a*. Surface of same, x18, showing relative size of zoœcia and interspaces on the explanate portion of the zoarium.

4 *b*. Irregular branch, natural size.

4 *c*. Surface of same, x18, showing smaller zoœcia apertures and more numerous mesopores than 4 *a*.

4 *d* and 4 *e*. Tangential and vertical sections of a branch, x18.
St. Louis group, Pella, Iowa.
Illinois State Museum.

Plate LXXV—*Continued.*

PAGE.

Fig. 5. STICTOPORELLA BASALIS, Ulr. (See also Pl. LXVIII and LXIX.).. 532

5. Surface of the erect portion of the zoarium near the base, x9. Shows portions of two of the large maculæ.
5 *a*. Portion of same, x25, showing the sloping area around the apertures of both the zoœcia and mesopores.
5 *b*. Tangential section, x50.
5 *c*. Portion of a vertical section of the erect frond, x18, showing the flexuous median lamina, delicate inferior hemisepta, and the tubular form of the primitive portion of the zoœcia.
Keokuk group, Warsaw, Ill.
Illinois State Museum.

Fig. 6. LEIOCLEMA GRACILLIMUM Ulr.. 429

6. Group of stems belonging to one zoarium, natural size.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.
6 *a*. Surface of a branch, x9, showing the usual characters of the species.
6 *b*. Small portion of same, x18, to show the minute characters more in detail.

Fig. 7. LEIOCLEMA WACHSMUTHI Ulr.. 428

7. Surface of the expansion, x9. The specimen was collected by Mr. Charles Wachsmuth from rocks of the Kinderhook group at Marshalltown, Iowa. It is now in the Illinois State Museum.
7 *a*. Portion of same, x18.
7 *b*. Vertical section, x18, showing tabulation of mesopores and zoœcia.

Fig. 8. LEIOCLEMA SUBGLOBOSUM Ulr.. 428

8. Two views of a split specimen, natural size. Position, locality, and present lodgment, same as for fig. 7.
8 *a*. Vertical section, x18, showing tabulation of zoœcia and mesopores.
8 *b*. Transverse section, x18. Many of the mesopores appear as though their diaphragms might have been perforated originally.

Fig. 9. LEIOCLEMA? ARANEUM Ulr...... 431

9. Surface of an example, x9.
Chester group, Monroe Co., Ill.
Illinois State Museum.
9 *a*. Vertical section, x18.
9 *b*. Tangential section, x18.
9 *c*. Portion of same, x35, showing the numerous minute acanthopores in the zoœcia walls.

Low Carb Bryozoa

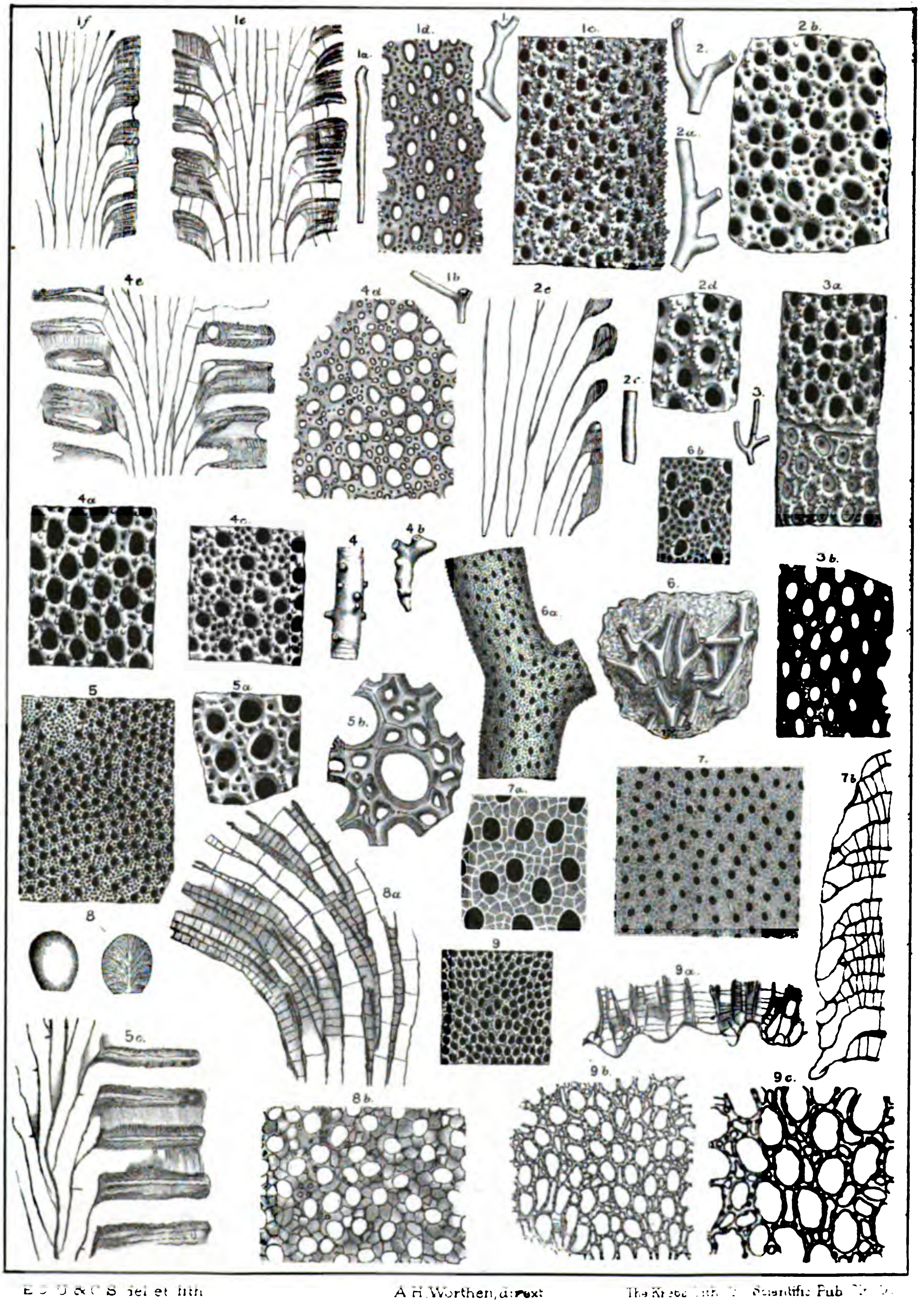

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PLATE LXXVI.

PAGE

Fig. 1. **MEEKOPORA? APERTA** Ulr 485

1. An example of the natural size, showing the irregular mode of branching, with a portion of the surface x9.

1 *a*. Tangential section, x18.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 2. **CYSTODICTYA PUSTULOSA** Ulr 495

2. A specimen showing its natural size and the arrangement of the zoœcia apertures.

2 *a*. Portion of surface of same, x9, showing the papilliform elevation of the zoœcia apertures.
Keokuk group, King's Mountain, Ky.
E. O. Ulrich's collection.

Fig. 3. **CYSTODICTYA LINEATA** var. **MAJOR** Ulr 495

An example of this variety, natural size. The diagonal arrangement of the zoœcia is more conspicuous in the drawing than natural.
St. Louis limestone,? Alton, Ill.
Illinois State Museum.

Fig. 4. **CYSTODICTYA NITIDA** Ulr.... 493

4. An example of the natural size, showing its mode of branching.

4 *a* and 4 *b*. Portions of its surface, x9 and 18, showing the fully matured condition of the zoarium.

4 *c*. Small portion of the surface of another well preserved but less fully matured example, x18.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Fig. 5. **CYSTODICTYA AMERICANA** Ulr.. 494

5 and 5 *a*. Two fragments of the natural size. The zoœcia are ranged in from three to five rows, and, when magnified, closely resemble those of fig. 4 *c*.

Fig. 6. **MEEKOPORA CLAUSA** Ulr. (See also Pl. LXXVII).. 485

A fragment of this species, showing its natural size and the arrangement of the maculæ and zoœcia.
Chester group, Sloan's Valley, Ky.
E. O. Ulrich's collection.

Plate LXXVI—*Continued.*

PAGE.

Fig. 7. COSCINIUM LATUM Ulr. 497

7. Natural size view of a specimen that preserves the expanded base and a large part of the perforated frond.
Burlington limestone, Henderson Co., Ill.
Illinois State Museum.

7 *a* and 7 *b*. Surface of two fragments, x9, showing the zoœcia apertures in different stages of development.
Burlington, Iowa.
E. O. Ulrich's collection.

Fig. 8. DICHOTRYPA ELEGANS Ulr 500

8. Well preserved silicified fragment of the natural size.
St. Louis group, Elizabethtown, Ky.
E. O. Ulrich's collection.

8 *a*. Basal portion of a large specimen, natural size, having all the zoœcia closed by a deposit of solid calcareous tissue,
Monroe Co., Ill.
Illinois State Museum.

8 *b*. Portion of surface of fig. 8, x12, showing one of the maculæ and surrounding zoœcia.

8 *c*. Tangential section, x18, showing the characters of the zoarium just above the median laminæ.

8 *d*. Tangential section, x18, dividing the zoœcia just beneath their apertures.

Fig. 9. DICHOTRYPA INTERMEDIA Ulr. 500

9. The most complete example seen, natural size.

9 *a*. Surface, x12.
St. Louis limestone, Alton, Ill.
Illinois State Museum.

9 *b*. Small portion of a vertical section, x18.

9 *c*. Tangential section, x18, showing well developed lunaria and other features a short distance beneath the surface.

VOL. VIII. PL. LXXVI.

GEOLOGICAL SURVEY OF ILLINOIS.

(Low Carb Bryozoa)

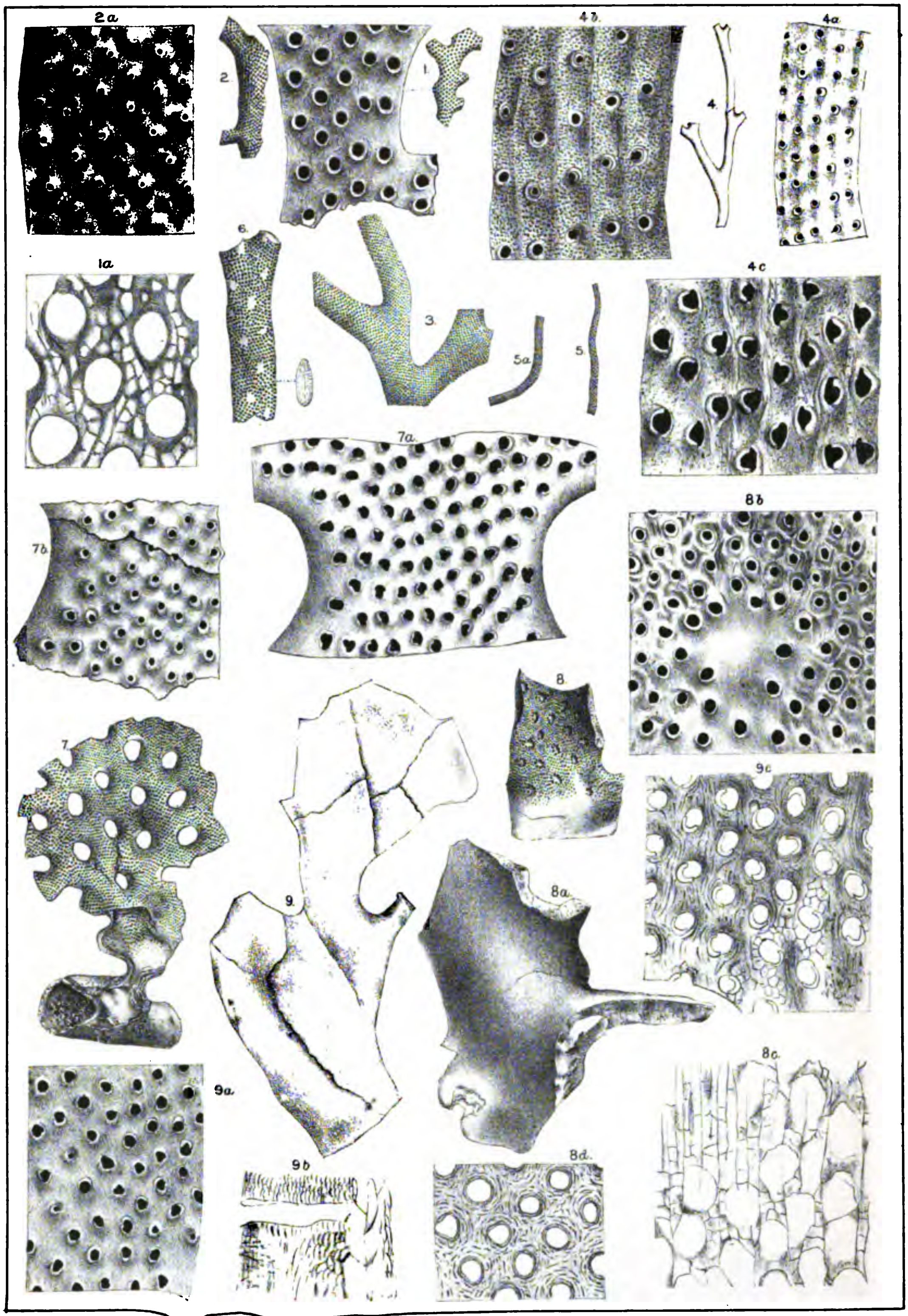

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PLATE LXXVII.

PAGE.

Fig. 1. DICHOTRYPA FLABELLUM (Rominger) 501

1. The basal portion of a large silicified example of this species, natural size.
   St. Louis group, Spergen Hill, Ind.
   Illinois State Museum.

1 *a*. Surface of same, x9, showing the usual appearance.

1 *b*. Surface of a better preserved example, x9, showing the striate character of the interspaces and maculæ.

Fig. 2. DICHOTRYPA LYROIDES Ulr 502

2. An example of this species showing the thick rounded base. Natural size.

2 *a*. End view of same.
   St. Louis group, Southern Ky.
   E. O. Ulrich's collection.

2 *b*. Surface of a well preserved fragment, x9.

Fig. 3. ACTINOTRYPA PECULIARIS (Rominger) 503

3. Surface of a well preserved example, x9, showing arrangement of zoœcia apertures and one of the maculæ.

3 *a*. Small portion of same, x18, to show more clearly the tooth-like elevations of the internal ridges.

3 *b*. Tangential section. x18 showing characters of the zoarium a short distance beneath the surface.
   Keokuk group, Keokuk, Iowa.
   E. O. Ulrich's collection.

Fig. 4. PRISMOPORA TRIFOLIA (Rominger) 505

4. Small fragment, natural size. This specimen is thinner than usual.

4 a. About half of a more complete and stronger example, natural size. The lower portions on the left side represents part of the basal expansion.
   Keokuk, Iowa.
   Illinois State Museum.

4 *b*. An example of a wider form, differing further from *P. trifolia* in having larger cells and the "dimples" not extending to the margin.
   Keokuk, Iowa.
   E. O. Ulrich's collection.

Fig. 5. MEEKOPORA APPROXIMATA Ulr 484

Surface of the thin bifoliate expansion of a specimen of this species, x9.
Chester group, Chester, Ill.
Illinois State Museum.

Plate LXXVII—*Continued.*

PAGE.

Fig. 6. **Meekopora eximia** Ulr. 483

6. Fragment of this species, natural size, showing distribution of maculæ and zoœcia. Also view of the left edge, showing the bifoliate character of the zoarium and the oblique zoœcial tubes.
Chester group, Monroe Co., Ill.
Illinois State Museum.

6 *a*. Surface of same, x9.

6 *b*. Portion of 6 *a*, x18, with (?) oœcium.

6 *c*. Deep tangential section, x18, showing faint lunaria and mesopores.

6 *d*. Tangential section, x18, showing structure just beneath the surface.

Fig. 7. **Meekopora clausa** Ulr. (See also Pl. LXXVI) 485

7. Several zoœcia apertures closed with the perforated opercula, x18.

7 *a*. Portion of the surface of a branch, x9.

7 *b*. Vertical section, x18, from the flexuous median laminæ to the surface. Shows the vesicular tissue and two zoœcial tubes.

Fig. 8. **Streptopora dermata** Ulr. 488

8. Flattened fragment of this species showing distribution of oœcia; natural size.
Keokuk, Iowa.
E. O. Ulrich's collection.

Fig. 9. **Streptopora foveolata** Ulr. 487

9. Small portion of the surface of a large example, natural size, to show distribution of zoœcia and oœcia.

9 *a*. Portion of same, x9, showing rather irregular form of zoœcia apertures the elevated lunaria and two of the broken oœcial cysts.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Low Carb. Bryozoa.

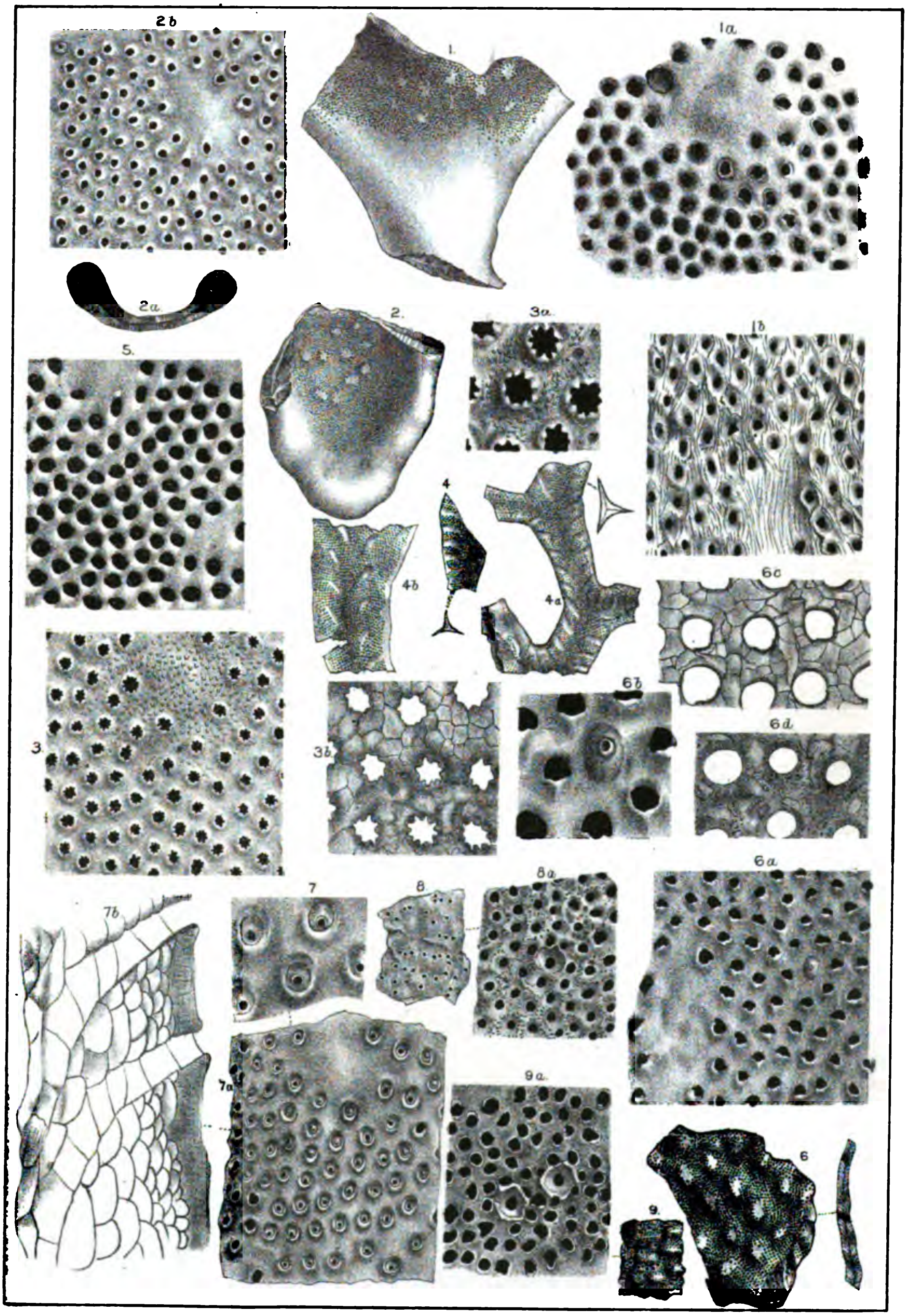

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PLATE LXXVIII.

PAGE.

Fig. 1. PRISMOPORA MINIMA Ulr 506

1. Two fragments of the natural size.
   Upper Coal Measures, Sparta, Ill.
   E. O. Ulrich's collection.

1 *a*. One of them, x9, showing the rather irregular arrangement of the zoœcia.

1 *b*. Transverse section of a branch, x18, showing its tripartite structure.

1 *c*. Tangential section, x18, showing distinct lunaria and other characters of the zoarium just beneath the surface.

Fig. 2. GLYPTOPORA PINNATA Ulr.. 516

The only example of the species seen. The drawing shows the pinnate arrangement of the zoœcia and maculæ. The prominence of the latter is largely accounted for by the abrasion which the frond has suffered.
Burlington limestone, Burlington, Iowa.
Illinois State Museum.

Fig. 3. GLYPTOPORA PLUMOSA Prout.. 512

3 and 3 *a*. Two fragments of this species, natural size, showing the plumose arrangement of the elongate dimples.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

3 *b*. A small but well preserved fragment, natural size. Same locality.
E. O. Ulrich's collection.

3 *c*. Portion of 3 *b*, x9, showing the smooth surface of the dimples and the usual arrangement of the zoœcia apertures.

Fig. 4. GLYPTOPORA KEYSERLINGI Prout.. 517

4. Nearly complete leaf or side of a cup of a small, but well preserved example of this species, natural size.
   Keokuk group, Nauvoo, Ill.
   E. O. Ulrich's collection.

4 *a*. Surface of same, x9, showing arrangement of zoœcia between the granulo-striate margin, and one of the dimples.

4 *b*. Several zoœcia apertures of same, x18, to show their irregular outline and the pitted interspaces.

Fig. 5. GLYPTOPORA MEGASTOMA Ulr.. 518

5. Surface of an example of this species, x9, showing arrangement of the comparative large sub-circular zoœcia apertures.
   Keokuk group, Keokuk, Iowa.
   E. O. Ulrich's collection.

5 *a*. Several apertures of same, x18.

Plate LXXVIII—*Continued.*

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Fig. 6. GLYPTOPORA SAGENELLA Prout.. 513

6 and 6 *a*. Opposite views of a small example of the typical form of this species.
Keokuk group, Bentonsport, Iowa.
Illinois State Museum.

Fig. 7. GLYPTOPORA SAGENELLA var. LATA, Ulr......... 515

Complete example of this variety, natural size. The opposite side is similarly divided into cup-shaped spaces, only where on this side we see the bottom of a cup, the other shows a ridge.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.

Fig. 8. GLYPTOPORA MICHELINIA Prout.... 515

8. Cupuliferous surface of an example of this species, natural size.
8 *a*. Opposite or epithecal surface of same. The specimen is worn through the epitheca, so that the vertical laminæ are shown.
8 *b*. A very small but high example, natural size, showing the faint dimples on the sides of the cups.
Warsaw beds, Barrett's Station, Mo.
Illinois State Museum.

Fig. 9. GLYPTOPORA PUNCTIPORA Ulr...... 519

9. Surface of a leaf of this species, x9, showing a dimple, and the arrangement of the compressed zoœcia apertures.
9 *a*. Small portion of same, x18.
Chester group, Monroe Co., Ill.
Illinois State Museum.

Fig. 10. GLYPTOPORA ELEGANS Prout.. 518

10. Nearly complete but small example, showing the arrangement of the leaves into deep cups; natural size. This figure also serves to illustrate the mode of growth of *G. keyserlingi*, *G. megastoma* and *G. punctipora*.
Warsaw beds, Warsaw, Ill.
Illinois State Museum.
10 *a*. Surface of another specimen, x9.
10 *b*. Portion of same, x18, showing the zoœcia apertures in a good state of preservation.
10 *c*. Vertical section, x18, showing several zoœcial tubes throughout their length on both sides of the median lamina.
10 *d* and 10 *e*. Two small portions of a tangential section.